
GPS AutoSteer System

Hardware Installation Manual



Supported Vehicles

John Deere Non-AutoTrac Ready

ILS			MFWD	
8120	8220	8100	8110	8120
8320	8420	8200	8210	8220
8520		8300	8310	8320
		8400	8410	8420

LEGAL DISCLAIMER

Note: Read and follow ALL instructions in this manual carefully before installing or operating the AutoSteer system.

Note: Take careful note of the safety information in the Safety Information section and throughout this manual.

The manufacturer disclaims any liability for damage or injury that results from failure to follow the instructions and warnings set forth herein.

Please take special note of the following warnings:

1. There is NO obstacle avoidance system included in the manufacturer's product. Therefore, users must always have an operator on the equipment when the AutoSteer system is in use to look for any obstacles including people, animals, trees, ditches, buildings, etc.
2. During installation of the AutoSteer system and during the Calibration and Tuning processes the vehicle's wheels turn from side to side and the vehicle moves. Be sure that all people and obstacles are clear of the vehicle before installation, calibration and tuning, or use of the AutoSteer system.
3. Use of the AutoSteer system is NOT permitted while the vehicle is on public roads or in public areas. Ensure that the system is OFF before driving on roads or in public areas.

Special Requirements

Tools

This list consists of special tools required to complete the installation. A complete set of common installation tools is assumed.

Allen Hex Key 1/4"	11/16" open wrench	16mm open wrench
Allen Hex Key 3/16"	5/8" open wrench	17mm open wrench
Allen Key 5/32"	9/16" open wrench (2x)	18mm open wrench
Allen Hex Key 1/8"	1/2" open wrench	19mm open wrench
15/16" open wrench	7/16" open wrench	22mm open wrench
7/8" open wrench	1/2" 12 point ratcheting wrench	24mm open wrench
13/16" open wrench	15/16" socket wrench	32mm open wrench
3/4" open wrench	13mm open wrench	22mm socket wrench
Breaker bar for 22mm socket	Hacksaw with steel cutting blade	Cleaning rags
Torque wrench for 22mm socket	Wire cutter small	5000 psi Pressure Gauge with a Short Hose and 1/8" Test Port Coupler that meets the SAE J1502 standard.
#1 Phillips screwdriver	Cleaning brush	Tape measure (12ft minimum)
#2 Phillips screwdriver	Ten Foot Ladder	Fiberglass Cable Puller

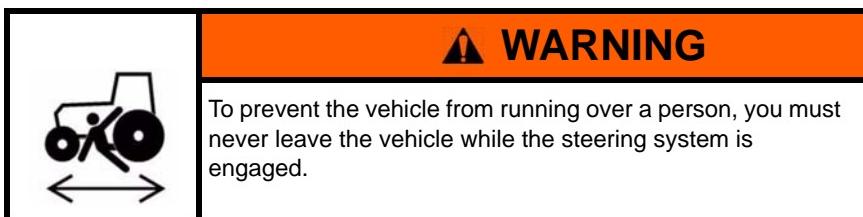
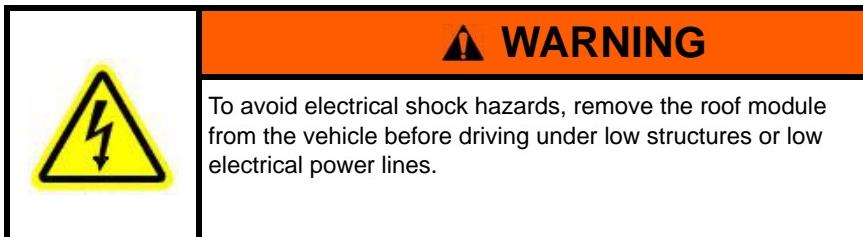
Safety Information

Warning Alerts

The AutoSteer system installer and manufacturer disclaim any responsibility for damage or physical harm caused by failure to adhere to the following safety requirements:

- As the operator of the vehicle, you are responsible for its safe operation.
- The steering system is *not* designed to replace the vehicle's operator.

Note: Verify that all screws, bolts, nuts, hose connections and cable connections are tight after the final installation of the AutoSteer system on the vehicle.





⚠ WARNING

High-Pressure Fluid Hazard

Read the Owner's Manual before installation. Wear hand and eye protection while performing hydraulic system maintenance. Relieve hydraulic system pressure before servicing the hydraulic system.



⚠ WARNING

To understand the potential hazards associated with the operation of AutoSteer equipment read the provided documentation before installing the steering system on a vehicle.



⚠ WARNING

To prevent the accidental engagement of steering and loss of vehicle control while driving on roads, shut down the Display (exit the program) and press down the blue Kill switch located on the top left corner of the terminal. Never drive on roads or in public areas with the steering system turned on.

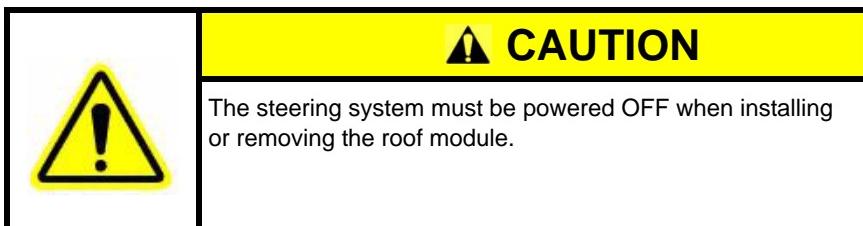
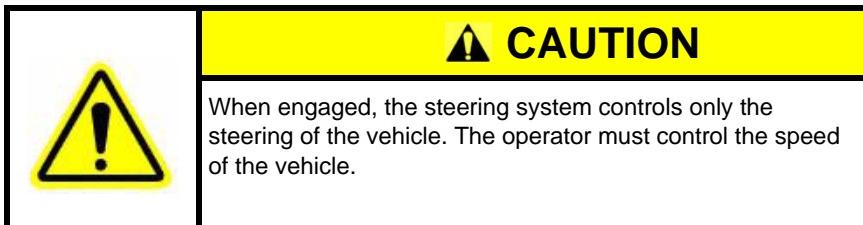
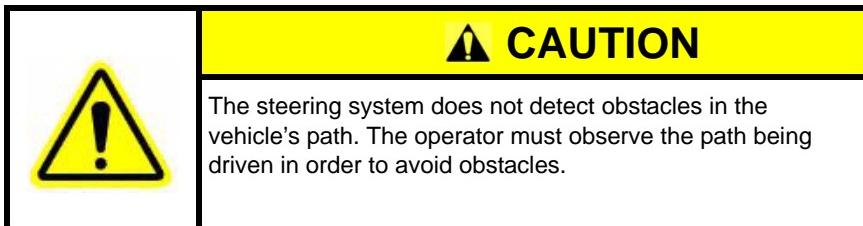
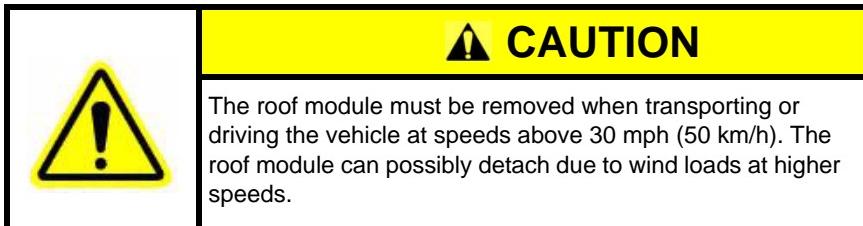


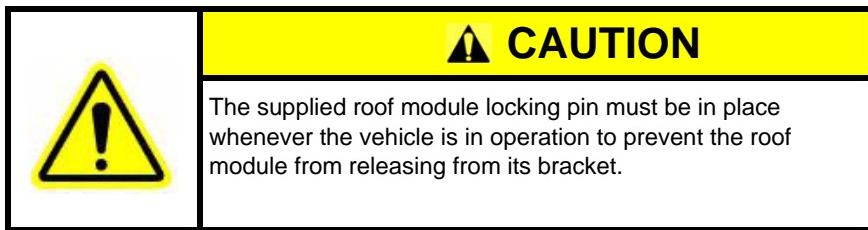
⚠ WARNING

Do not stand close to the wheels and do not move the machine while you are adjusting the relief valve. Turn off the engine and engage the parking brake before standing under or next to the machine.

Caution Alerts

The AutoSteer system installer and manufacturer disclaim any responsibility for damage or physical harm caused by failure to adhere to the following safety requirements:





Vehicle Requirements

The vehicle must be equipped with a fully functional Power Beyond System. The Power Beyond system provides pressure, tank, and load sense ports on the back of the vehicle.

The tractor steering system and hydraulic system must be in good working order before installing the AutoSteer system. Check for loose or worn parts. Drive the tractor before installing the AutoSteer system and confirm that it steers straight and the wheels can be turned from lock to lock. Check the steering system hydraulic hoses and connections to ensure there are no oil leaks.

The vehicle electrical system and battery must be in good working order.

The Tractor must be non-AutoTrac ready. AutoTrac-ready vehicles require a different installation kit. Contact your AutoSteer dealer for the correct installation kit.

We recommend that the tractor be fully cleaned before installing the AutoSteer system. A clean tractor will facilitate the overall installation and cable routing and will also reduce the chance for oil contamination when the hoses are opened. It is important to clean the area around the steering unit (Orbitrol), under the cab, and behind the rear cab cover.

Important Information

Note: Tighten all screws, bolts, nuts, hose connections and cable connections after the final assembly of the AutoSteer system on the vehicle.

Technical Support

Refer to your owner's manual for technical support information.

Contact Information

Refer to your owner's manual for contact information.

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Installation Overview

This **Installation Overview** chapter contains part numbers, kit overview diagram, cabling diagram and the installation procedure for the John Deere Installation Kit.

- *Identifying ILS and MFWD Vehicle Models*
- *Kit Overview*
 - *Assemblies*
 - *Steering Valve Kit Components*
 - *Hose Kit Components*
 - *Display Bracket Kit Components*
- *Installation Procedure Outline*
- *Cable Diagram*

This installation guide describes the installation of the AutoSteer system on several models of John Deere 8000 series Independent Linked Suspension (ILS) and Mechanical Front Wheel Drive (MFWD) wheeled tractors. The AutoSteer installation kit PN: 188-0008-01 is used on these series of these wheeled tractors. The vehicle specific sub-assemblies for the two tractor series are listed in *Table 1-1*.

Note: If you are installing an electric steering wheel actuator such as OnTrac II, skip the Steering Valve, SA Module, and SA Module Harness installation information in this book and refer to your electric steering product manual for further instructions.

Table 1-1 Part Numbers

John Deere 8000 Series ILS and 8000 Series MFWD ^a
153-0001-01
500-0295-01
152-0007-01

a. All non AutoTrac-Ready

Identifying ILS and MFWD Vehicle Models

Note: The installation procedure for the 8000 series ILS and the 8000 series MFWD vehicles is slightly different. Identify your vehicle model before beginning the installation.

The 8000 series MFWD vehicle front axle is one piece and does not have a suspension system. The MFWD is available on all series; 8000, 8010, 8020 and 8030 vehicles. See *Figure 1-1*.

Figure 1-1 John Deere 8420 MFWD



The front axle of the John Deere 8520 ILS has active suspension system with arms and cylinders on each side. See *Figure 1-2*.

Figure 1-2 John Deere 8520 ILS



Note: The ILS model only became available with the 8020 series and was not available on the older 8000 and 8010 series.

Kit Overview

Note: The John Deere vehicles supported in this manual share the same top-level Installation Kit PN: 188-0008-01. The following sections of this manual contain vehicle specific sub-assembly identification information.

Figure 1-3 John Deere Kit Components (PN: 188-0008-01)

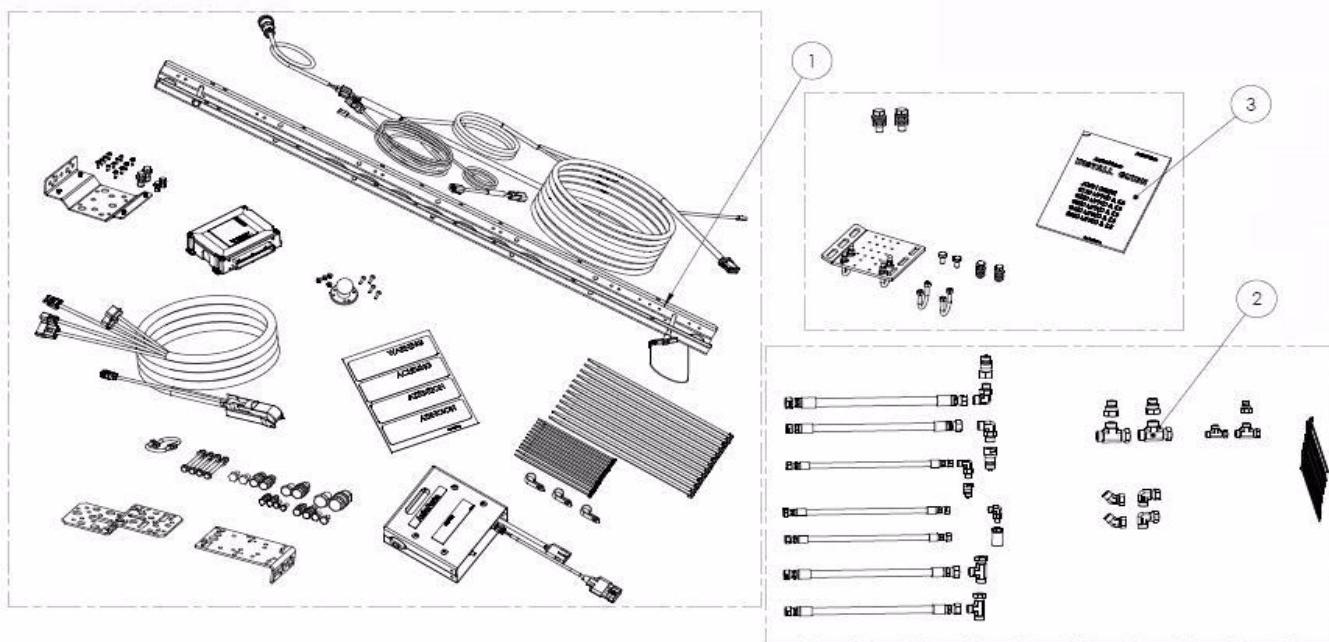


Table 1-2 John Deere Kit Components (PN: 188-0008-01)

Item	Component	Part Number
1.	Steering Valve Kit	153-0001-01
2.	Hose Kit	500-0295-01
3.	Display Bracket Kit	152-0007-01

Assemblies

The John Deere vehicle installation kit contains the following components:

- *Steering Valve Kit Components*
- *Hose Kit Components*
- *Display Bracket Kit Components*

Steering Valve Kit Components

Figure 1-4 Installation Kit Components (PN: 153-0001-01)

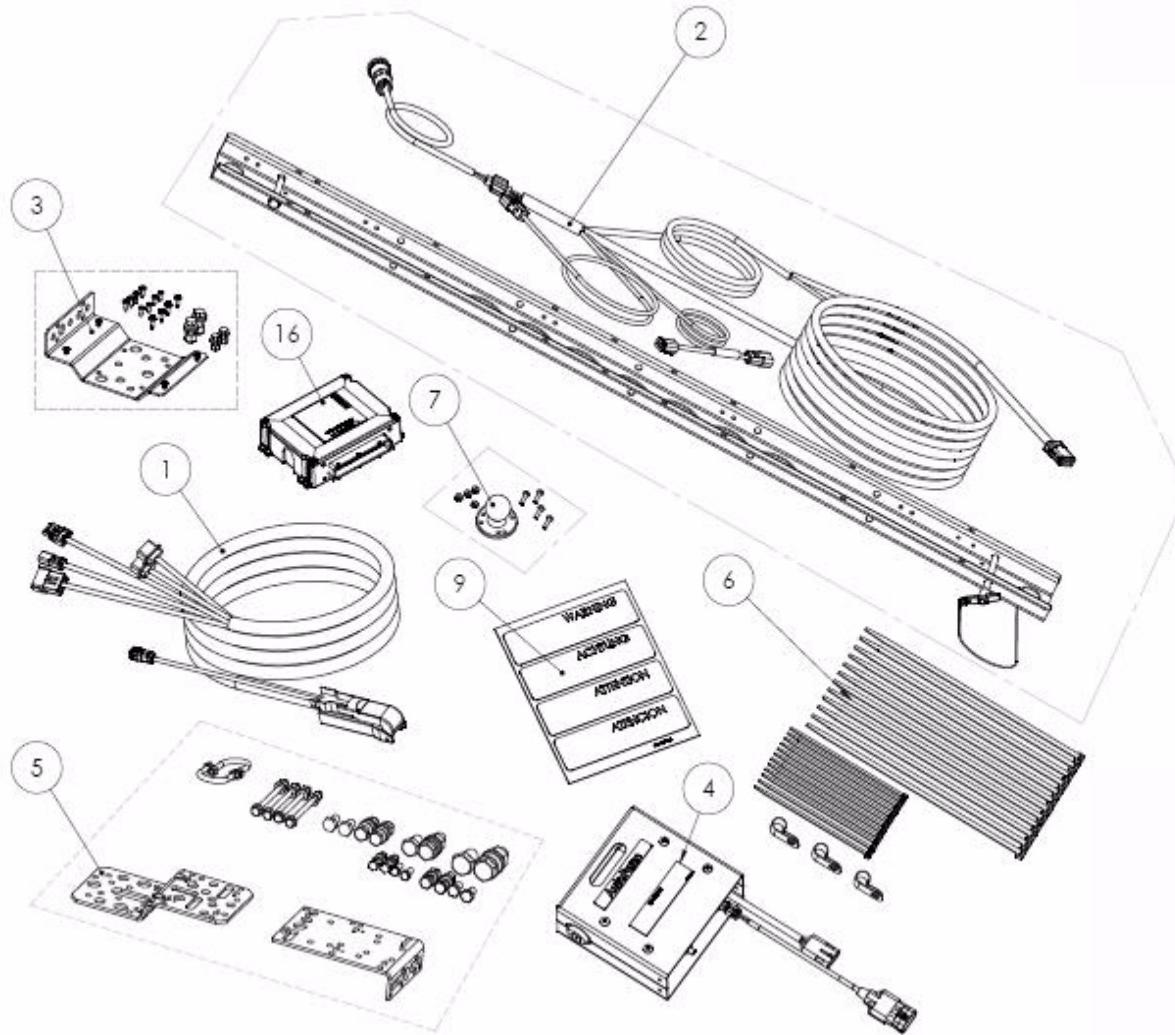


Table 1-3 Installation Kit Components (PN: 153-0001-01)

Item	Component	Part Number
1.	SA Module Harness	201-0371-02

Item	Component	Part Number
2.	Common Installation Kit	200-0497-02
3.	SA Module Bracket	200-0190-01
4.	Valve Assembly	200-0457-01
5.	Valve Bracket Kit	200-0434-01
6.	Mounting Hardware	200-0076-01
7.	Display Mounting Base Assembly	200-0508-01
9.	Warning Labels	603-0074-01
16.	SA Module Assembly	200-0206-01

Hose Kit Components

Figure 1-5 Hose Kit Components (PN: 500-0295-01)

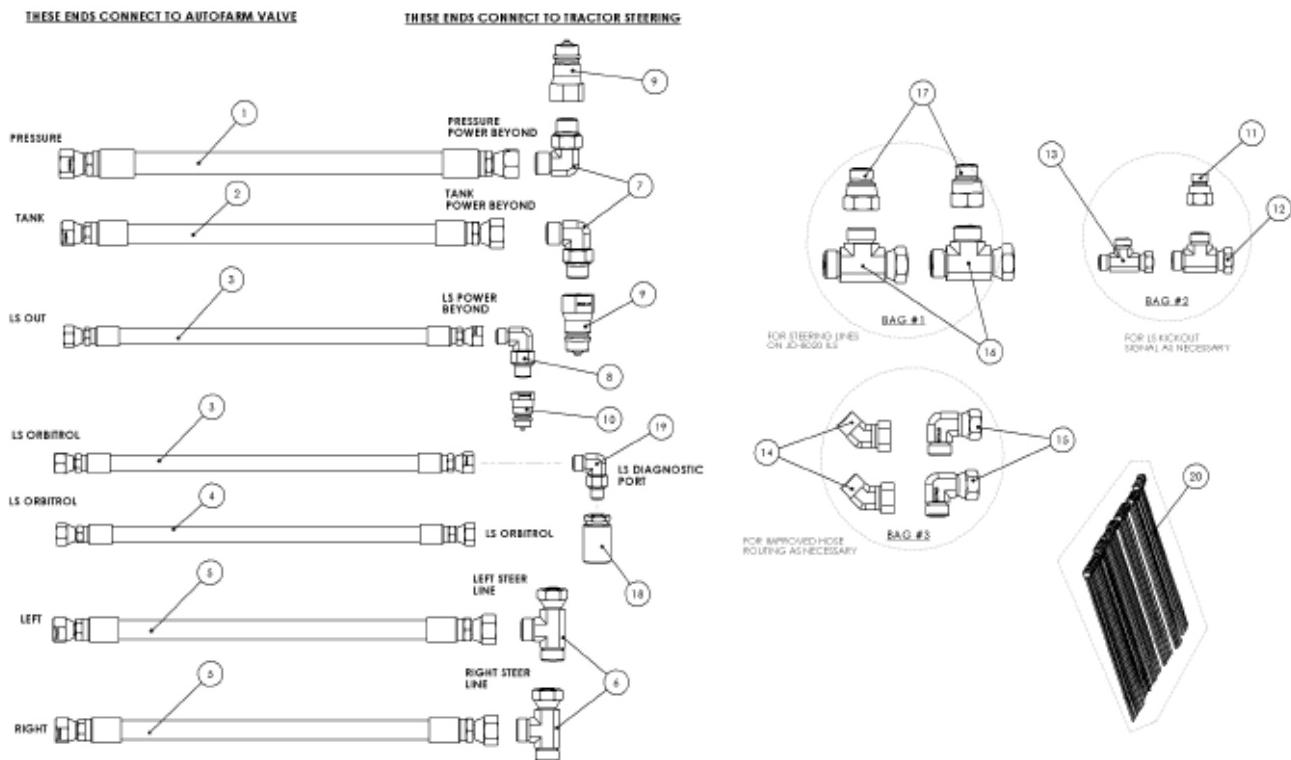


Table 1-4 Hydraulic Kit Components (PN: 500-0295-01)

Item	Component	Part Number
1.	Hose Assembly 1/2" x 150"	F451TC-JCJC080808-150
2.	Hose Assembly 3/8" x 150"	F451TC-JCJC060806-150

Item	Component	Part Number
3.	Hose Assembly 1/4" x 144"	F451TC-JCJC040404-144
4.	Hose Assembly 1/4" x 60"	F451TC-JCJC040404-60
5.	Hose Assembly 3/8" x 60"	F451TC-JCJC060806-60
6.	Adapter Run Tee	8 R6LO-S
7.	Adapter Elbow	8 C5OLO-S
8.	Adapter Elbow	4-6 C5OLO-S
9.	Quick Coupler	8010-15P
10.	Quick Coupler	SM-252-6FO
11.	Adapter Reducer	6-4 TRLON-S
12.	Adapter Run Tee	6 R6LO
13.	Adapter Run Tee	4 R6LO
14.	Adapter 45 Degree	8 V6LO-S
15.	Adapter Elbow	8 C6LO
16.	Adapter Run Tee	10 R6LO-S
17.	Adapter Reducer	10-8 TRLON-S
18.	Test Port Coupler	PD-240
19.	Adapter Elbow	4 C5OLO-S
20.	Cable Ties ^a	200-0467-01

- a. The colored cable ties included in the kit are used to identify the hydraulic hoses. Place identical colored cable ties at the ends of each hydraulic hose to positively identify the hose.

The suggested hose color assignments are as follows:

Pressure - Red

Tank - Green

LS Orbitrol - Blue

LS Out - Grey

Steer Right - Yellow

Steer Left - Orange

Display Bracket Kit Components

Figure 1-6 Display Bracket Kit Components (PN: 152-0007-01)

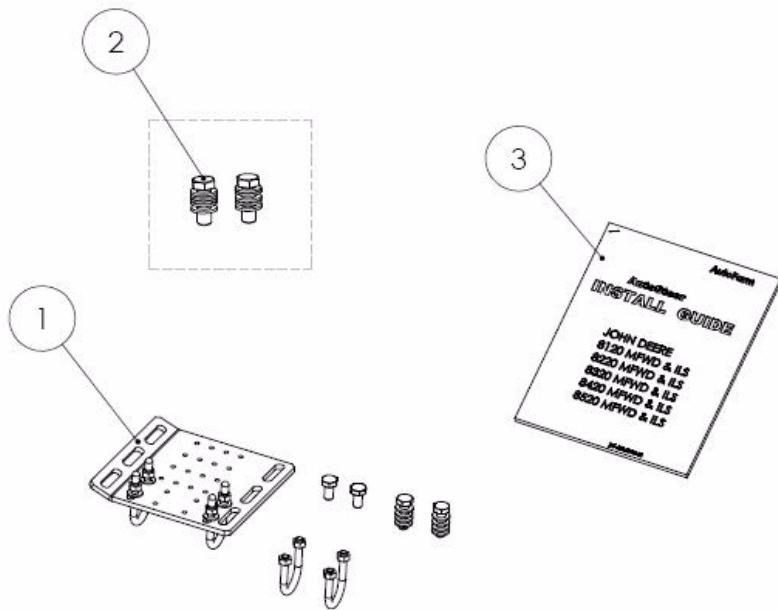


Table 1-5 Display Bracket Kit Components (PN: 152-0007-01)

Item	Component	Part Number
1.	Display Bracket	200-0469-02
2.	Roof Module Bolt Kit	200-0238-01
3.	Installation Guide	602-0195-01

Installation Procedure Outline

Note: The system interconnect cable diagram in the *Cable Diagram* on page 10 section of this chapter shows the AutoSteer electrical connections.

1. Verify shipped components.

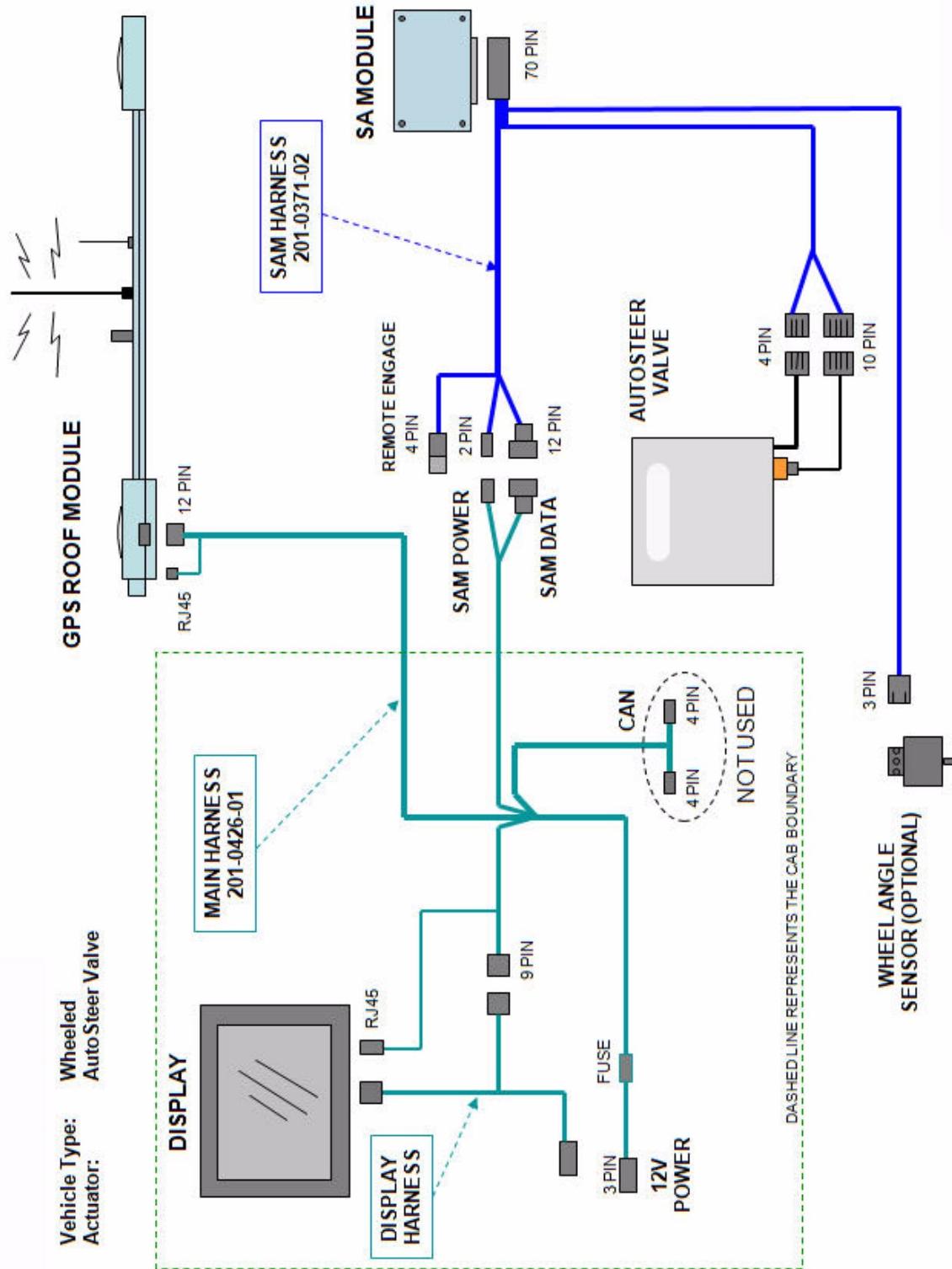
Note: *Step 2., Step 3., Step 4., Step 5., Step 8., Step 9., Step 14., and Step 15.* are skipped if installing an electric steering actuator.

2. Install the Hydraulic Valve Assembly.
3. Install the Hydraulic Hoses.
4. Install the Wheel Angle Sensor. (Optional)
5. Install the SA Module.
6. Install the Roof Rail on the cab roof.
7. Install the Roof Module on the Roof Rail.
8. Install the SA Module Harness and route cables to the various sensors.
9. Route SA Module data and power cable towards the cab.
10. Install the Display Bracket and the RAM Mount Ball inside the cab.
11. Install the Display using a RAM Mount Arm.
12. Install the Main Data Harness and route cables to Roof Module and power connector.

Note: Instructions for connecting the vehicle kit cables to the Display can be found in the Display owner's manual.

13. Connect the Main Data Harness to the Display Harness.
14. Connect the Main Data Harness to the SA Module Harness (12 pin + 2 pin connectors).
15. Install the Auxiliary Harness to the GPS receiver on the Roof Module. (optional)
Refer to your Auxiliary Harness User Manual for instructions on making these connections.
16. Verify all connectors are properly coupled and secured.
17. Power ON the AutoSteer system.
18. Calibrate the vehicle.
19. Tune the vehicle.
20. Verify the system has been installed properly and operates satisfactorily.

Cable Diagram



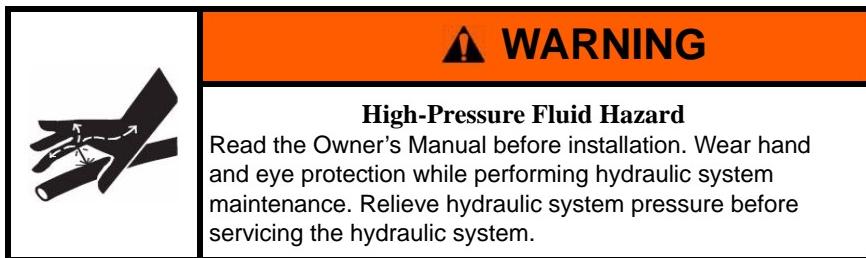
Steering Valve Installation

This **Steering Valve Installation** chapter information is provided in the following sections:

- *Steering Valve Installation Procedure Overview*
- *Hose Kit*
- *Steering Valve Configuration*
 - *AutoSteer Valve Configuration for Power Beyond Installation*
- *Install the Valve Bracket*
- *Hydraulic Hose Connection Overview*
- *Hydraulic Hose Connection Procedure*
 - *Connect the Load Sense Out Hose to Power Beyond*
 - *Connect the Tank Hose to Power Beyond*
 - *Connect the Pressure Hose to the Power Beyond Valve*
 - *Orbitrol Load Sense Signal Hose Connection*
 - *Right Steering Hose Connection*
 - *Left Steering Hose Connection*
 - *Pressure Transducer*
- *Adjusting the Relief Valve*
- *Steering Valve Installation Checklist*

Steering Valve Installation Procedure Overview

1. Install an internal plug to configure the AutoSteer valve for Power Beyond installation.
2. Install the AutoSteer valve bracket and valve on the tractor.
3. Connect the six hoses between the valve and the tractor steering unit (Orbitrol).
4. Check for oil leaks.
5. Adjust the AutoSteer pressure relief valve.
6. Perform a functional test to confirm correct valve operation.



Hose Kit

Figure 2-1 Hose Kit Components (500-0295-01)

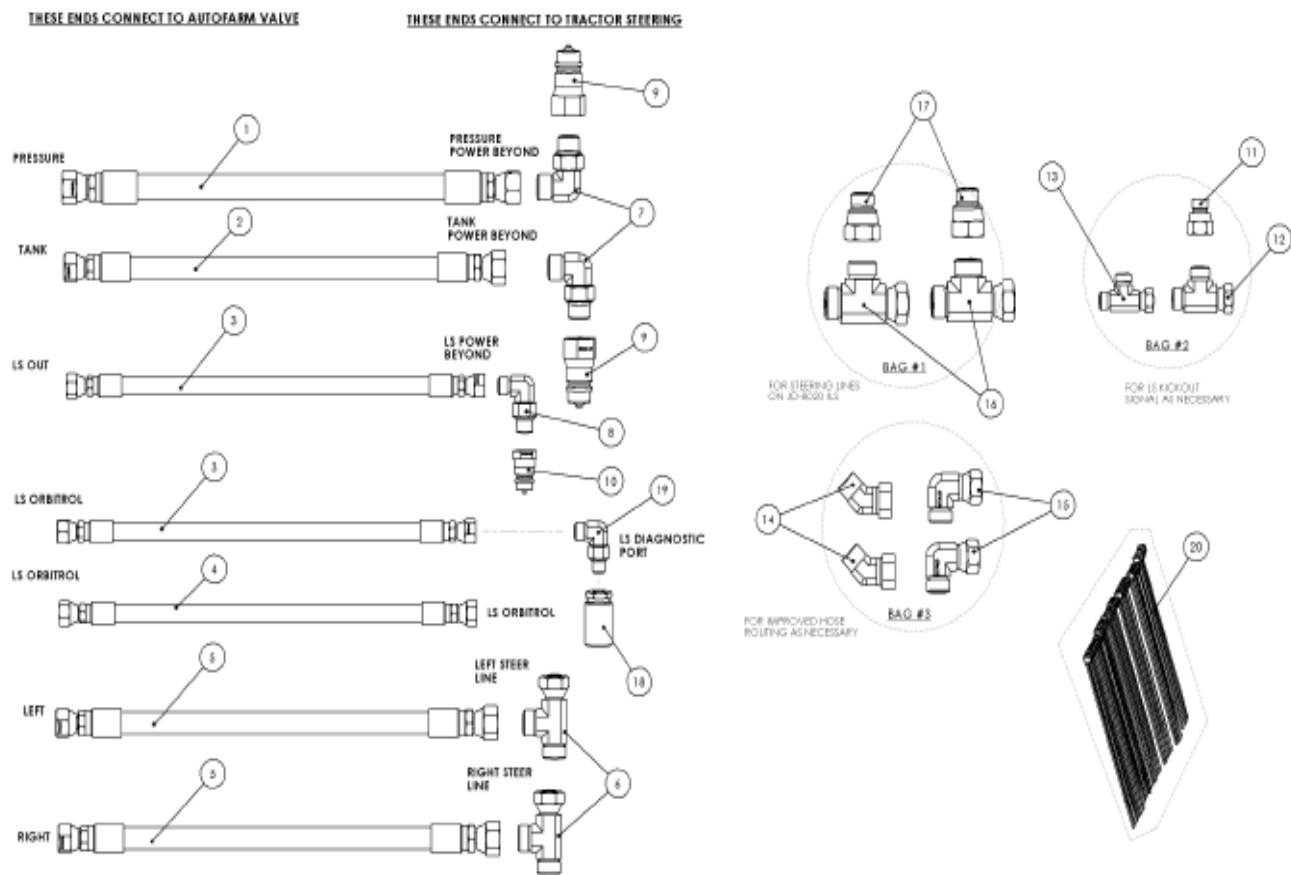


Table 2-1 John Deere Hose Kit Components)

Item	Component	Part Number
1.	Hose Assembly 1/2" x 150"	F45ITC-JCJC080808-150
2.	Hose Assembly 3/8" x 150"	F45ITC-JCJC060806-150
3.	Hose Assembly 1/4" x 144"	F45ITC-JCJC040404-144
4.	Hose Assembly 1/4" x 60"	F45ITC-JCJC040404-60
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9.	Quick Coupler	8010-15P

Item	Component	Part Number
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11.	Adapter Reducer	6-4 TRLON-S
12.	Adapter Run Tee	6 R6LO
13.	Adapter Run Tee	4 R6LO
14.	Adapter 45 Degree	8 V6LO-S
15.	Adapter Elbow	8 C6LO
16.	Adapter Run Tee	10 R6LO-S
17.	Adapter Reducer	10-8 TRLON-S
18.	Test Port Coupler	PD-240
19.	Adapter Elbow	4 C5OLO-S
20.	Cable Ties ^a	200-0467-01

- a. The colored cable ties included in the kit are used to identify the hydraulic hoses. Place identical colored cable ties at the ends of each hydraulic hose to positively identify the hose.

Note: The suggested hose color assignments are as follows:

Pressure - Red

Tank - Green

LS Orbitrol - Blue

LS Out - Grey

Steer Right - Yellow

Steer Left - Orange

Steering Valve Configuration

1. Use a 3/16" Allen key to remove the four cover screws. See *Figure 2-2*.
2. Remove the front cover to access the hose connections, pressure transducer and relief valve. See *Figure 2-2*.

Note: *Figure 2-3* shows the purpose for each of the hydraulic connections on the Steering Valve Assembly.

Figure 2-2 Steering Valve Assembly

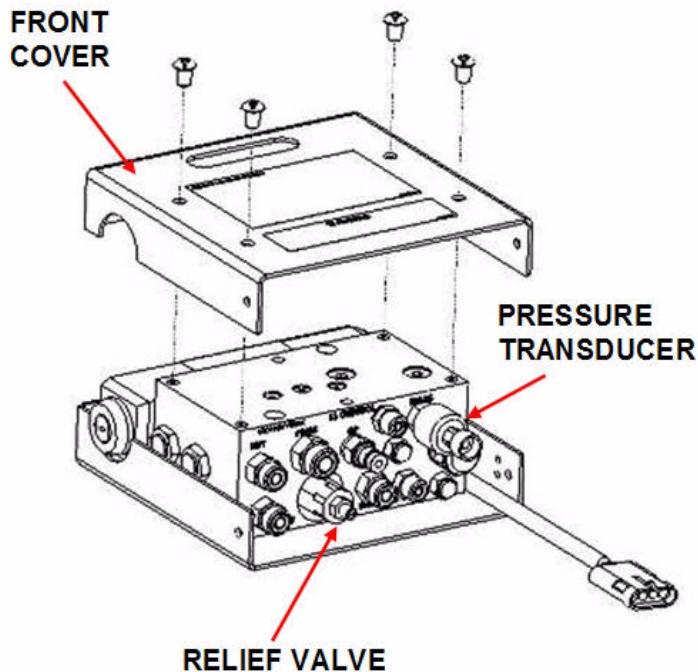
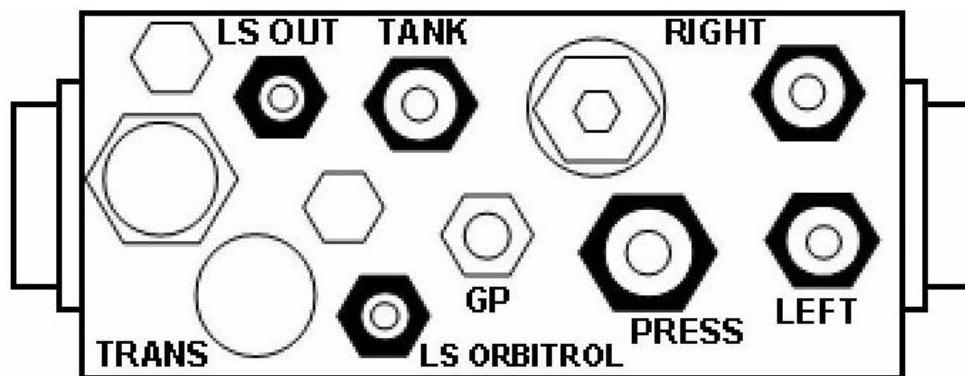


Figure 2-3 Steering Valve Port Identification



Note: The ports shown in *Figure 2-3* are upside-down relative to the ports shown in *Figure 2-2*.

Table 2-2 Valve Functions and Fitting Sizes

Hose Adapter	Fitting Type/Size
PRESS = PUMP PRESSURE (Power Beyond)	-8 ORFS
TANK = TANK / RETURN (Power Beyond)	-6 ORFS
LS ORBITROL = LS FROM ORBITROL	-4 ORFS
LS OUT = LS (Power Beyond)	-4 ORFS
LEFT = LEFT STEERING CYLINDER	-6 ORFS
RIGHT = RIGHT STEERING CYLINDER	-6 ORFS
GP = DIAGNOSTICS PORT	1/8"
TRANS = PRESSURE TRANSDUCER	SAE #4 ORB

AutoSteer Valve Configuration for Power Beyond Installation

An internal plug must be installed in the AutoSteer valve to configure the valve for Power Beyond operation. Follow the procedure shown below.

Note: The AutoSteer valve will not operate correctly if you do not install the plug.

1. Remove the front valve cover using a 3/16" hex key to loosen the four screws.
2. Identify the threaded plug shipped with the valve in a parking position identified as "PLUG" on the front face. See *Figure 2-4*.

Note: The plug does not have a hole and must not be mistaken with the two orifices that are also shipped next to the plug on the valve. See *Figure 2-4*.

Figure 2-4 Steering Valve With Cover Removed

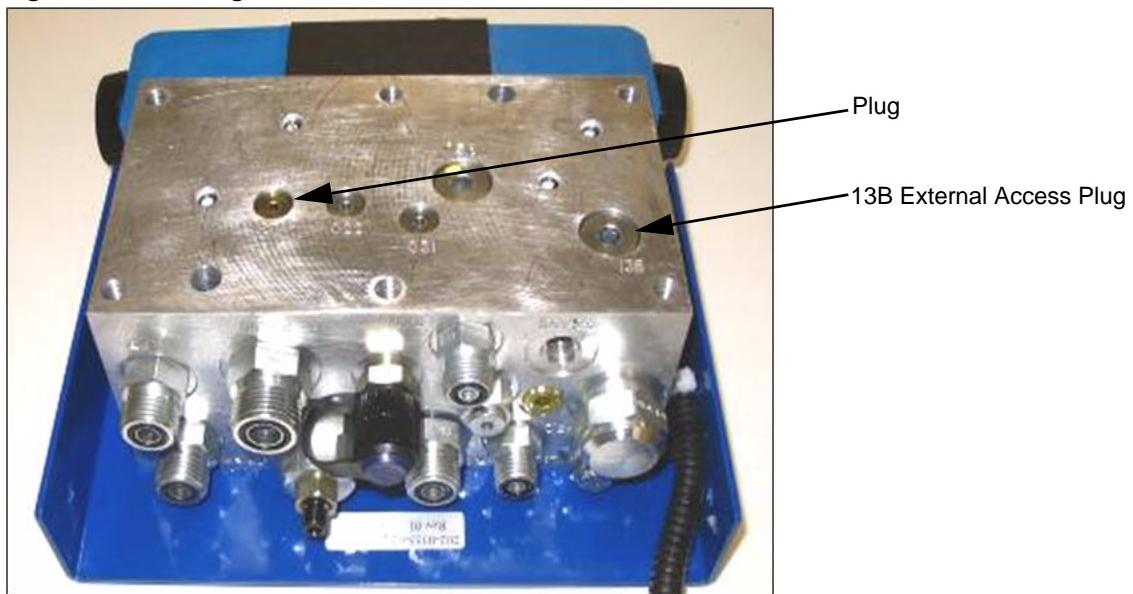


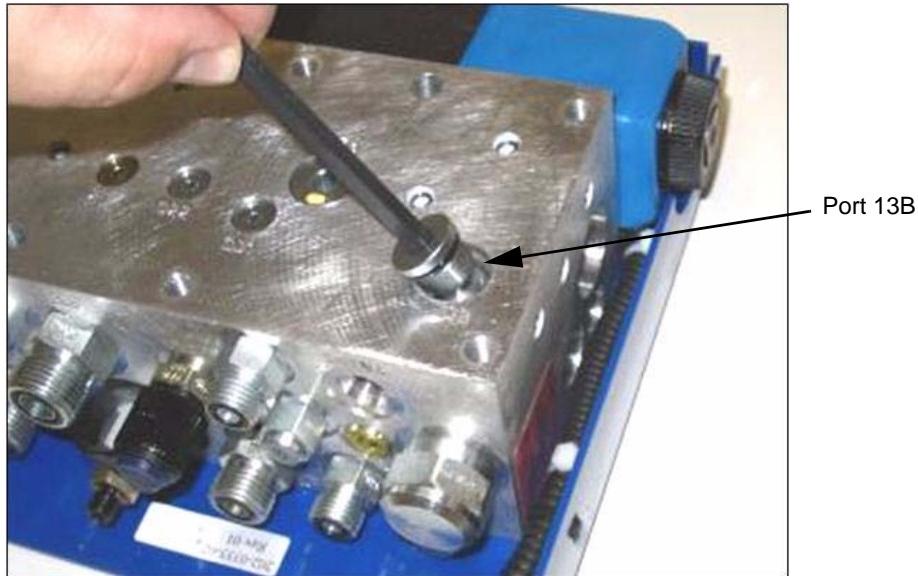
Table 2-3 Plug and Orifice Configuration Summary

Type of Installation	13A	13B	13C
Factory Default Configuration	Plug	Open	Plug
Power Beyond Configuration	Plug or Orifice	Plug	Plug

Note: The plug in position 13A may be replaced by a 0.022" orifice if the pump does not stroke down when AutoSteer is not turning the wheels. The optional 0.022" orifice works as a bleed-down orifice for the AutoSteer Load Sense signal when required.

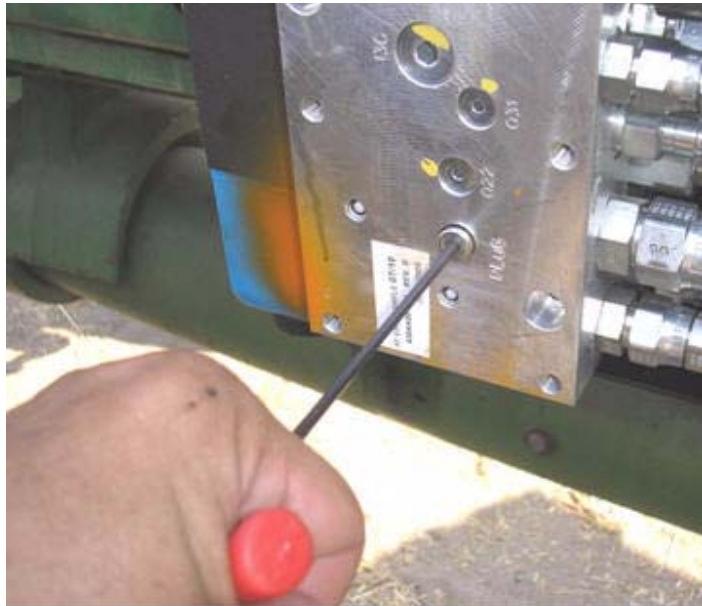
3. Identify the large external access plug identified in position **13B** (see *Table 2-3*).
4. Remove the external plug in position **13B** using a $\frac{1}{4}$ " hex key. See *Figure 2-5*.

Figure 2-5 Removing External Plug



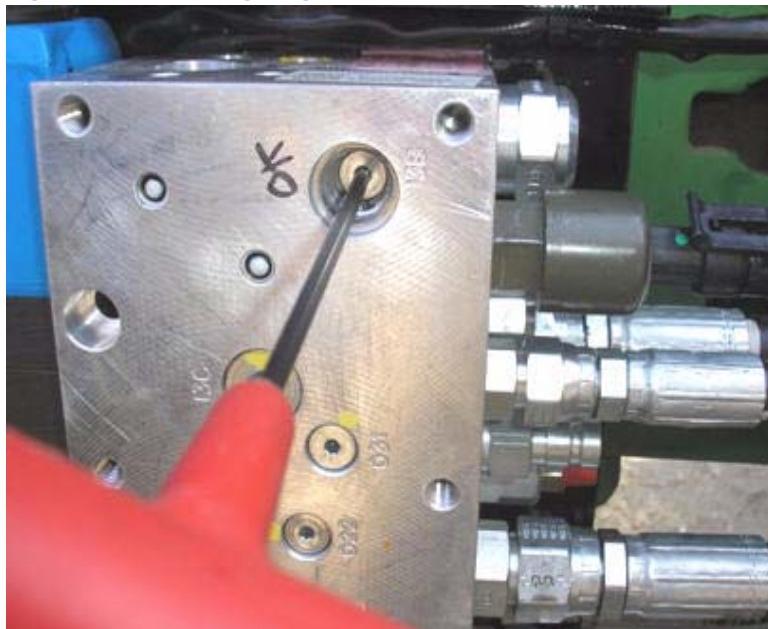
5. Remove the small plug from position “PLUG” using a 1/8” hex key. See *Figure 2-6*.

Figure 2-6 Remove Plug



6. Install the small plug inside the hole in position **13B** (see *Table 2-3*). It will engage an existing thread about 1" below the surface. See *Figure 2-7*. Do not over tighten the plug.

Figure 2-7 Installing Plug In 13B Position

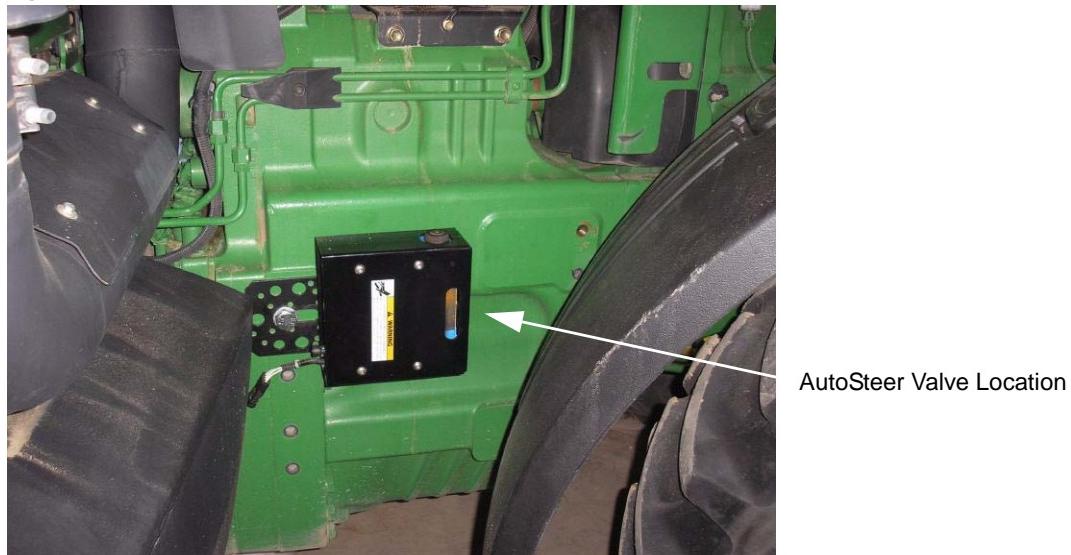


7. Re-install the large external plug in position **13B**.
8. This concludes the plug installation. The valve is now ready to be installed on the tractor.

Install the Valve Bracket

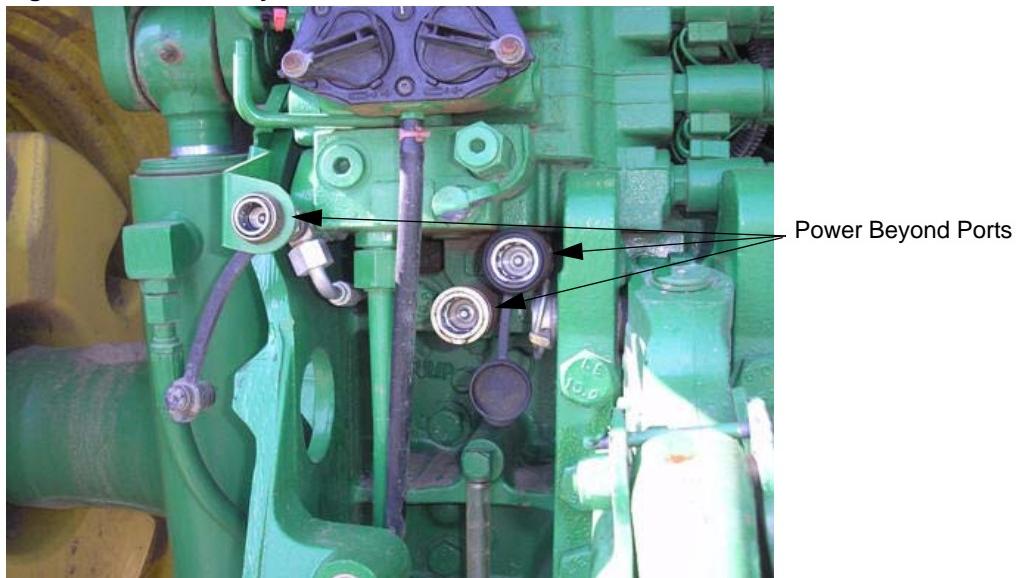
The AutoSteer valve is installed on the tractor frame right side just ahead of the cab in the position shown in *Figure 2-8*. A universal valve bracket is secured to the tractor using a short M20 bolt provided with the AutoSteer Bracket Kit. All hoses are connected to the steering unit (Orbitrol) under the engine hood in front of the cab.

Figure 2-8 AutoSteer Valve Location



1. Locate the Power Beyond ports located on the rear of the vehicle. See *Figure 2-9*.

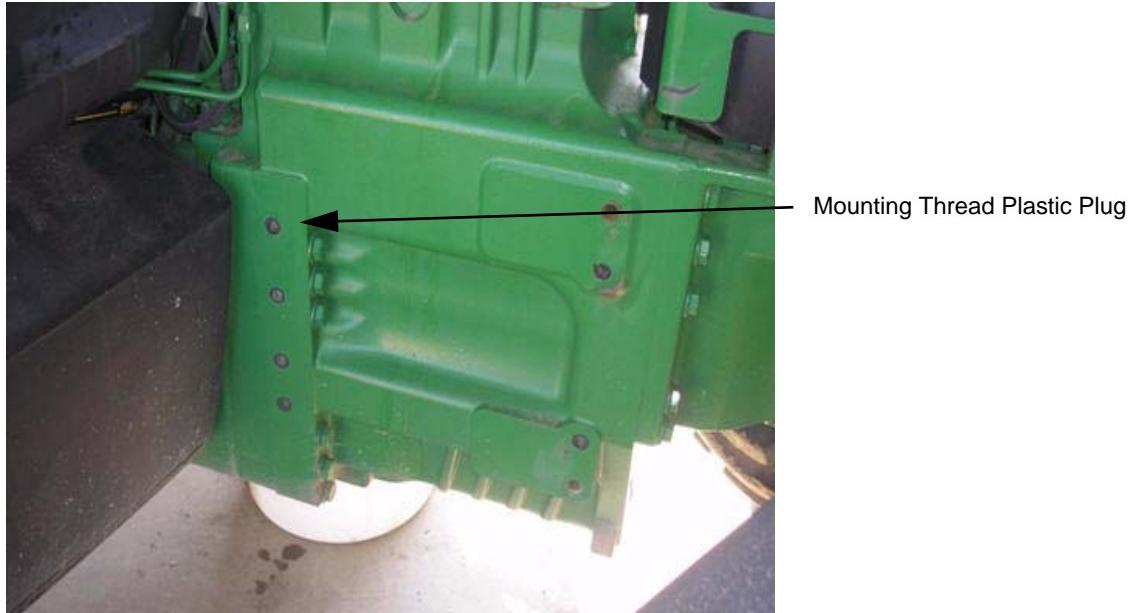
Figure 2-9 Power Beyond Ports



Install the Valve Bracket

2. Locate the plastic plugs that cover mounting threads on the right side of the tractor frame, just ahead of the cab. See *Figure 2-10*.

Figure 2-10 Steering Valve Mounting Location



3. Remove the plastic cap from the thread shown in *Figure 2-11*. This M20 thread is used to mount the AutoSteer valve bracket.

Note: If the tractor is equipped with side tanks or other accessories that use the same mounting point, you may choose another available thread for mounting the valve bracket. You may also choose to install the valve on the left side of the tractor. The chosen position must not interfere with the front tires or fenders when the wheels are turned to full lock.

Figure 2-11 Removing the Threaded Mount Cover



4. Install the bracket in the position shown in *Figure 2-12* and secure using one short M20 bolt with a washer.
5. Tighten the hex bolt to 250 ft-lbs (340 N.m).

Note: You may slide the bracket forward along the oblong hole to provide a greater clearance for the hoses exiting the valve.

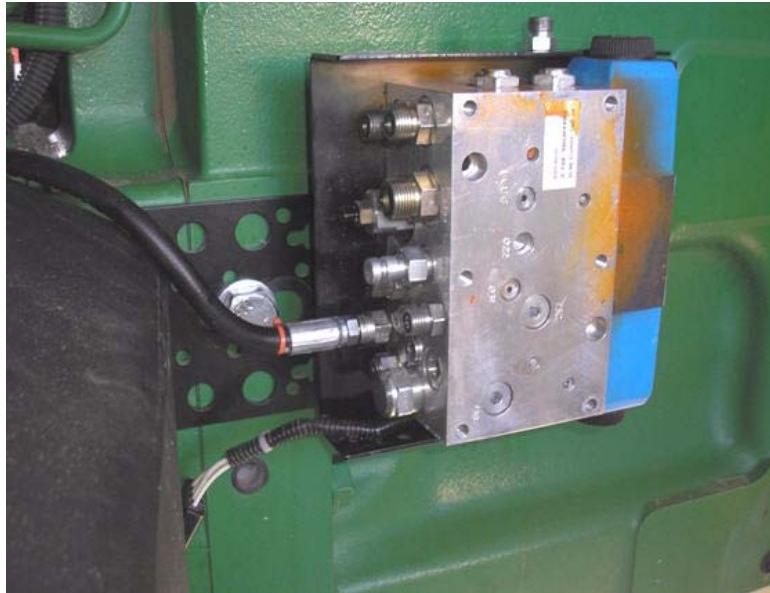
Figure 2-12 Steering Valve Bracket Mounted



Install the Valve Bracket

6. Install the valve in the position shown in *Figure 2-13*.

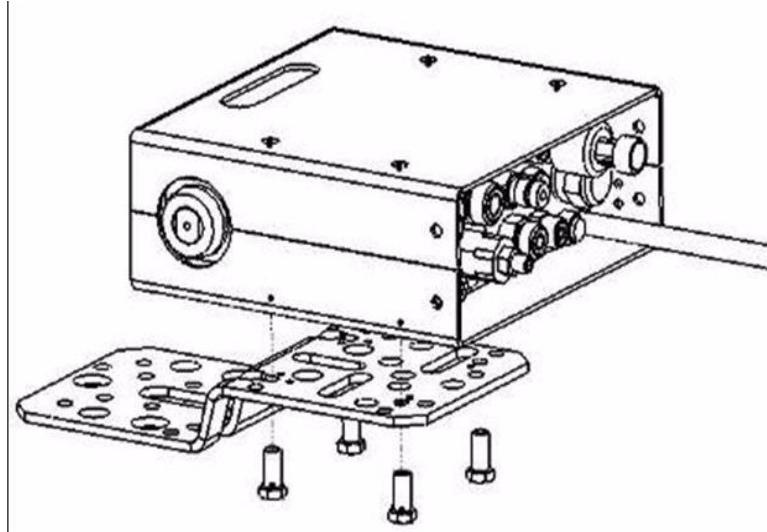
Figure 2-13 Steering Valve Mounted



Note: You must remove two hex screws and loosen two hex screws on the back of the valve before mounting the valve on the bracket. The two loose hex screws will fit slots on the valve bracket and help in the alignment of the valve on the bracket.

7. Secure the valve onto the bracket in the position shown using four 5/16" hex screws. See *Figure 2-14*.
8. Tighten the four screws using a 1/2" ratchet wrench. See *Figure 2-14*.

Figure 2-14 Mounting Valve to Bracket



Hydraulic Hose Connection Overview

Note: Follow the order of installing hoses described below to enable easier hose connections on the AutoSteer valve. Refer to *Figure 2-15* for hose identification numbers.

1. Connect a Long 3/8" hose [2] from the TANK port on the AutoSteer valve to the T port on the power beyond.
 2. Connect a long 1/4" hose [3] from the LS OUT port on the AutoSteer valve to the LS port on the power beyond.
 3. Connect a short 1/4" hose [4] from the LS ORBITROL port on the AutoSteer valve to the test port coupler on the Orbitrol.
 4. Connect a short 3/8" hose [5] from the RIGHT port on the AutoSteer valve to a Tee on the right steer line on the Orbitrol.
 5. Connect a long 3/8" hose [1] from the PRESS port on the AutoSteer valve to the Pressure port on power beyond.
 6. Connect a short 3/8" hose [6] from the LEFT port on the AutoSteer valve to the Left steer line on the Orbitrol.
-

Note: You must install a run tee on the steer line to allow the hose connection

7. Double check all hose connections and confirm that they are connected correctly at both ends.
-

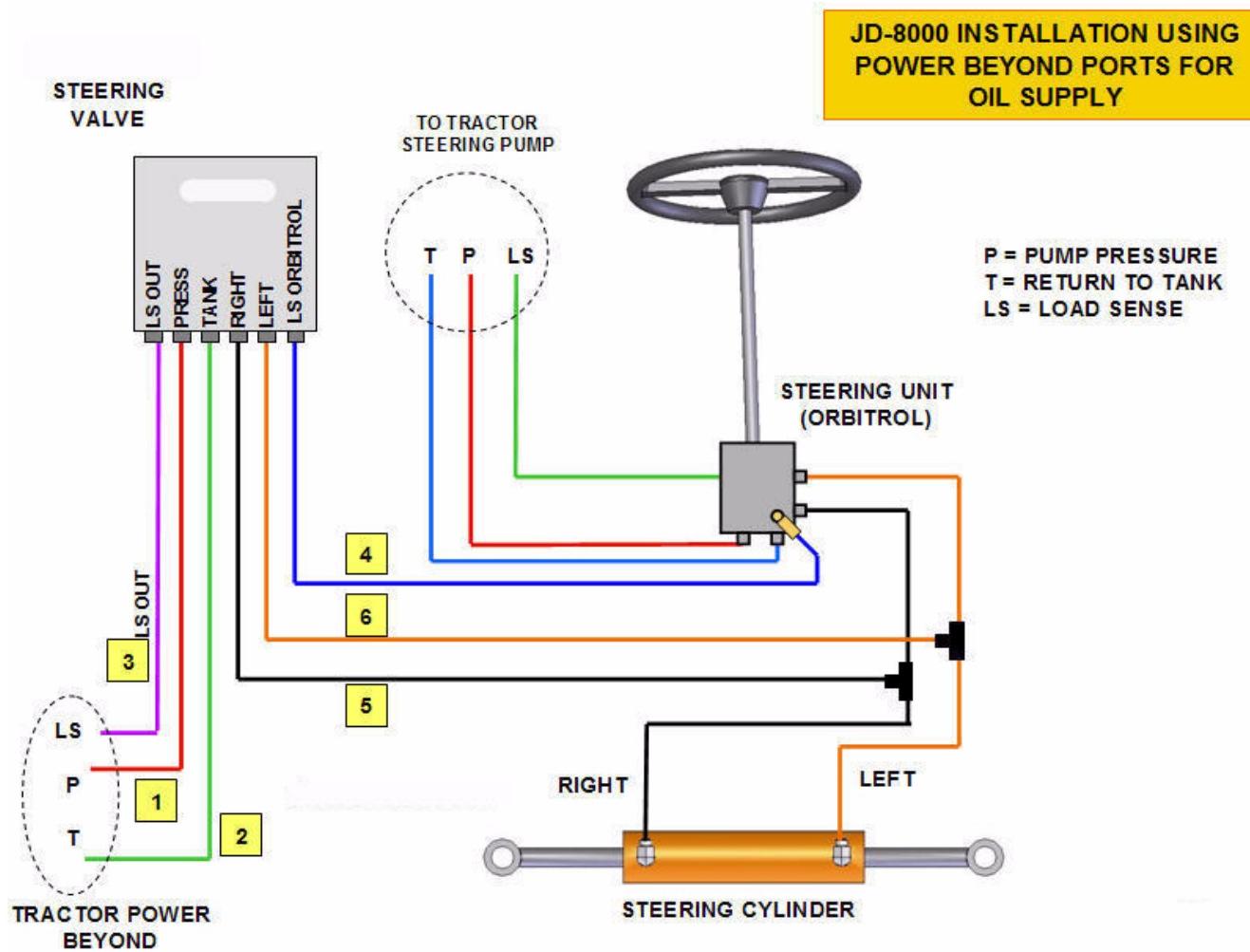
Note: It is very important that the Tank hose be correctly connected to allow proper operation of the AutoSteer relief valve.

8. Tighten all hose connections at both ends.
-

Note: Your hose kit includes a pair of larger -10 run Tees and reducers to be used if necessary on the ILS tractors which may have larger diameter hoses for the right and left steer lines.

Install the Valve Bracket

Figure 2-15 Power Beyond Hydraulic Connection Diagram



Hydraulic Hose Connection Procedure

Note: The hoses must be connected in the correct order for best fit and ease of installation. Refer to the hose diagram in *Figure 2-15* and the instructions in the *Hydraulic Hose Connection Overview* section on *page 23* for detailed information on connecting the hydraulic hoses.

Connect the Load Sense Out Hose to Power Beyond

1. Locate the Load Sense female coupler on the back of the tractor. See *Figure 2-16*.

Note: The exact position of the coupler may vary depending on the tractor model. This coupler can usually be identified by the 1/4" hose that connects it to the plate on top of the valve stack.

Figure 2-16 Power Beyond Load Sense Female Coupler



Install the Valve Bracket

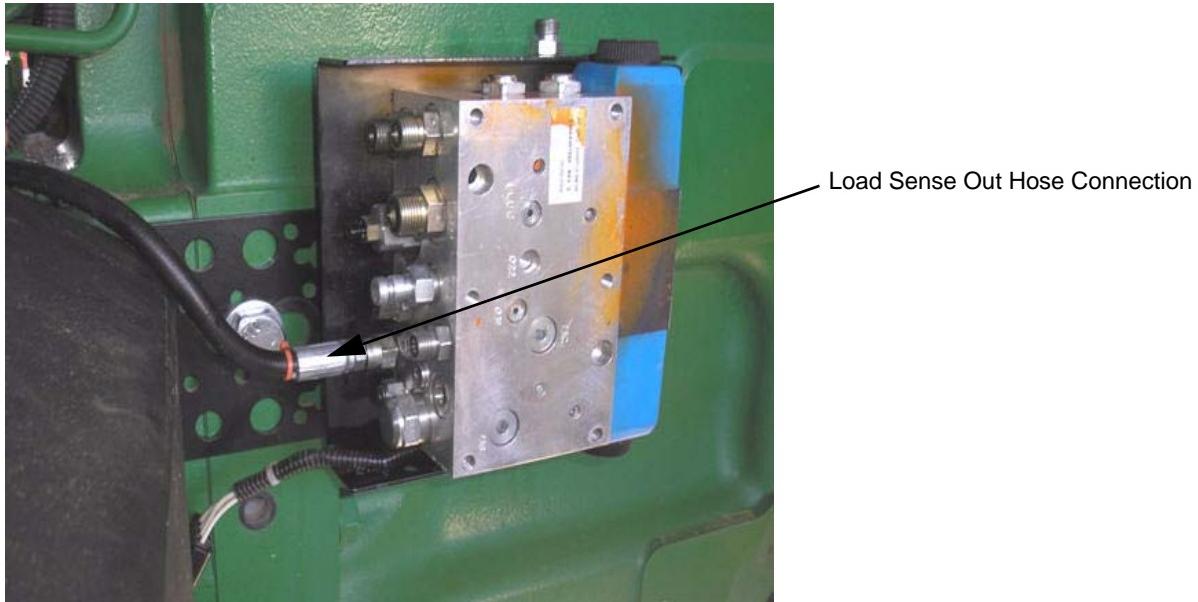
2. Connect the small AutoSteer coupler to the Power Beyond port, connect the ORB elbow adapter, then connect the AutoSteer LS Out hose. See *Figure 2-17*.

Figure 2-17 AutoSteer Load Sense Out Connection to Power Beyond Port



3. Connect the other end of the hose to the LS OUT port on the AutoSteer valve as shown in *Figure 2-18*.

Figure 2-18 AutoSteer Load Sense Out Connection

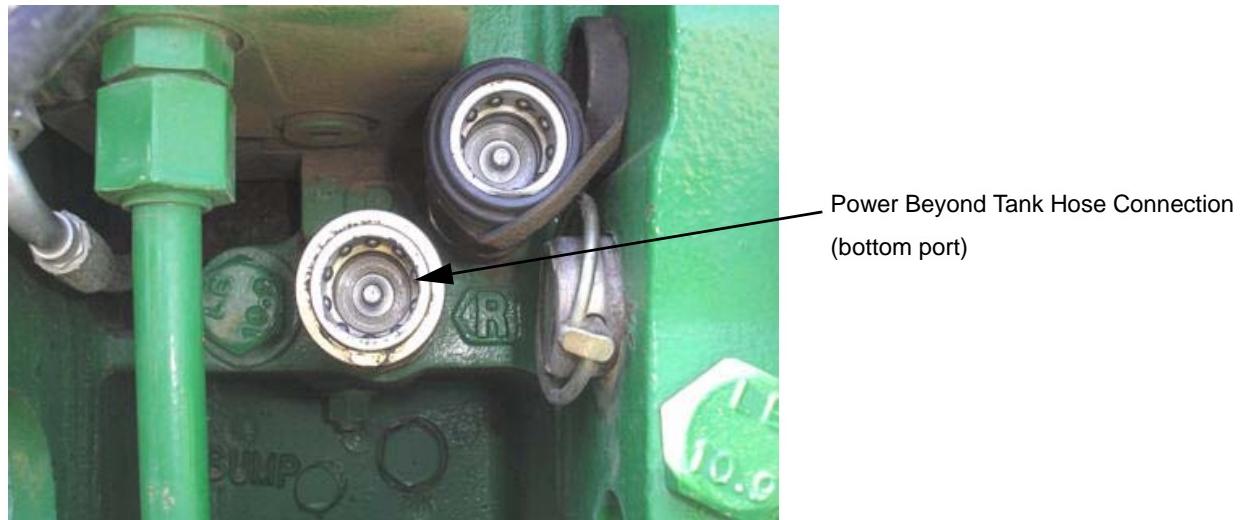


Connect the Tank Hose to Power Beyond

Note: Refer to *Figure 2-15* and the *Hydraulic Hose Connection Overview* for information on how to connect the hoses. The hoses must be connected in the correct order for best fit and ease of installation.

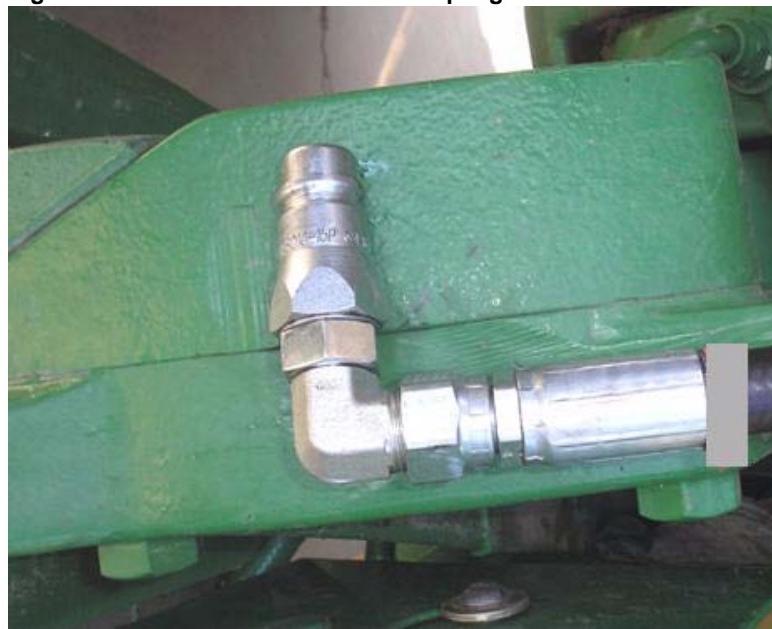
1. Locate the female Tank Return coupler on Power-Beyond as shown above. This coupler is identified on the cast frame as "R". See *Figure 2-19*.

Figure 2-19 Power Beyond Tank Hose Connection



2. Pre-assemble a large male coupler on the end of the AutoSteer Tank hose. The Tank hose is the long 3/8 hose. *Figure 2-20*.

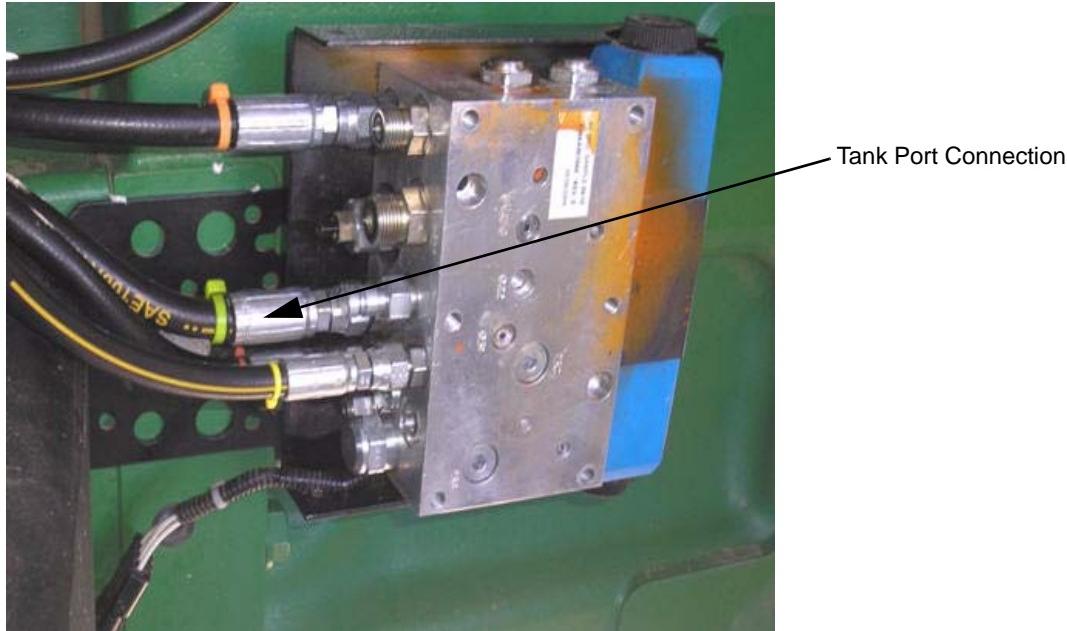
Figure 2-20 AutoSteer Tank Hose Coupling Assembled



Install the Valve Bracket

3. Route the Tank hose under the cab towards the AutoSteer valve and connect the other end of the AutoSteer Tank hose to the TANK port on the AutoSteer valve as shown in *Figure 2-21*.

Figure 2-21 Steering Valve Tank Valve Hose Connection



Connect the Pressure Hose to the Power Beyond Valve

Note: Refer to *Figure 2-15* and the *Hydraulic Hose Connection Overview* for information on how to connect the hoses. The hoses must be connected in the correct order for best fit and ease of installation.

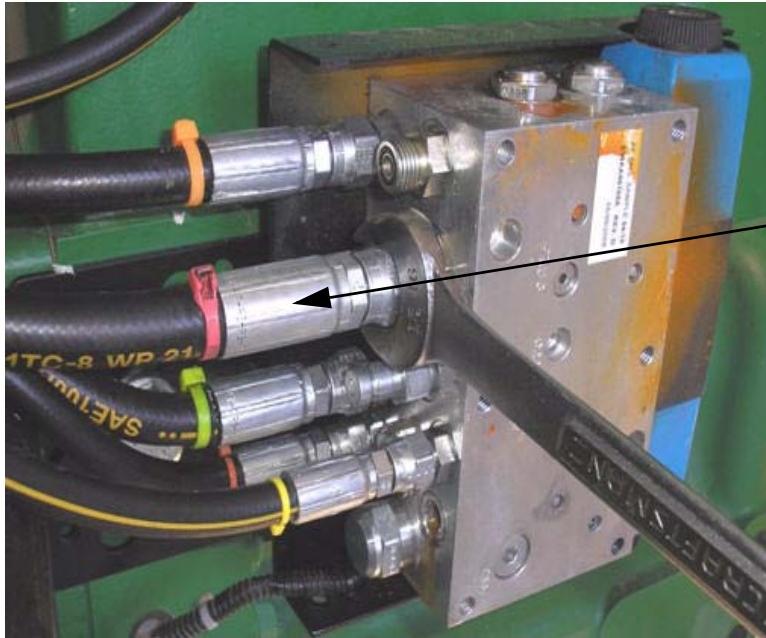
1. Connect the AutoSteer Pressure hose to the female pressure coupler on power-beyond as shown in *Figure 2-22*.

Note: The AutoSteer Pressure hose is the long 1/2" hose that has a larger diameter and larger fitting on the valve end. The pressure coupler is identified as "P" on the cast tractor frame power beyond valve.

Figure 2-22 Power Beyond Pressure Hose Connection

Power Beyond Pressure Hose Connection
(top port)

2. Connect the other end of the AutoSteer Pressure hose to the AutoSteer valve PRESS port as shown in *Figure 2-23*.

Figure 2-23 Steering Valve Pressure Port Connection

Pressure Port

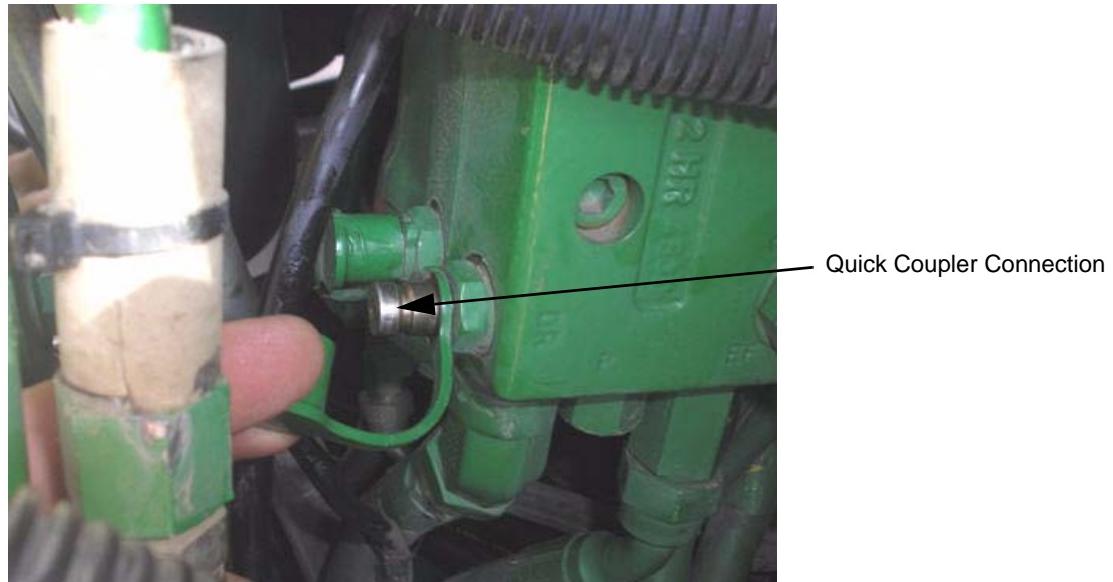
Orbitrol Load Sense Signal Hose Connection

Note: Refer to *Figure 2-15* and the *Hydraulic Hose Connection Overview* for information on how to connect the hoses. The hoses must be connected in the correct order for best fit and ease of installation.

1. Locate the steering Load Sense diagnostics quick coupler on the steering unit (Orbitrol) shown in *Figure 2-24*.

Note: This coupler senses the steering Load Sense pressure and is used to get a pressure signal for AutoSteer manual kick-out.

Figure 2-24 Orbitrol Load Sense Quick Coupler Connection



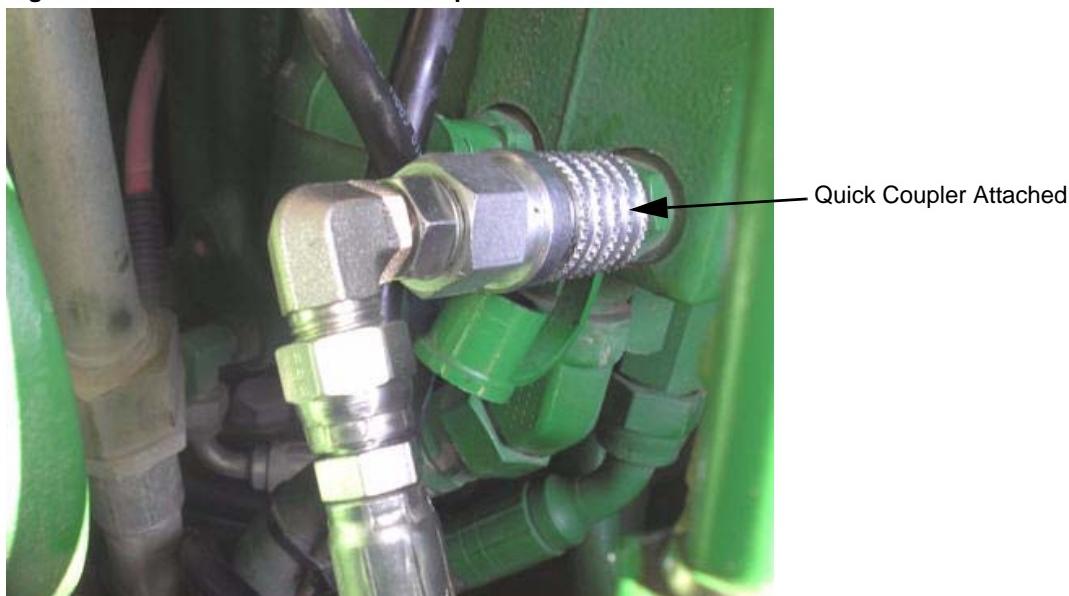
2. Assemble the female coupler shown in *Figure 2-25*, plus an elbow adapter on the end of the short AutoSteer Load Sense hose.

Figure 2-25 AutoSteer Load Sense Female Coupler



3. Connect the AutoSteer female coupler to the test port on the Orbitrol. See *Figure 2-26*.
4. Ensure the coupler snaps into place when fully engaged.
5. Pull out on the coupler to ensure it is firmly engaged on the test port.

Figure 2-26 Orbitrol Female Quick Coupler Attached

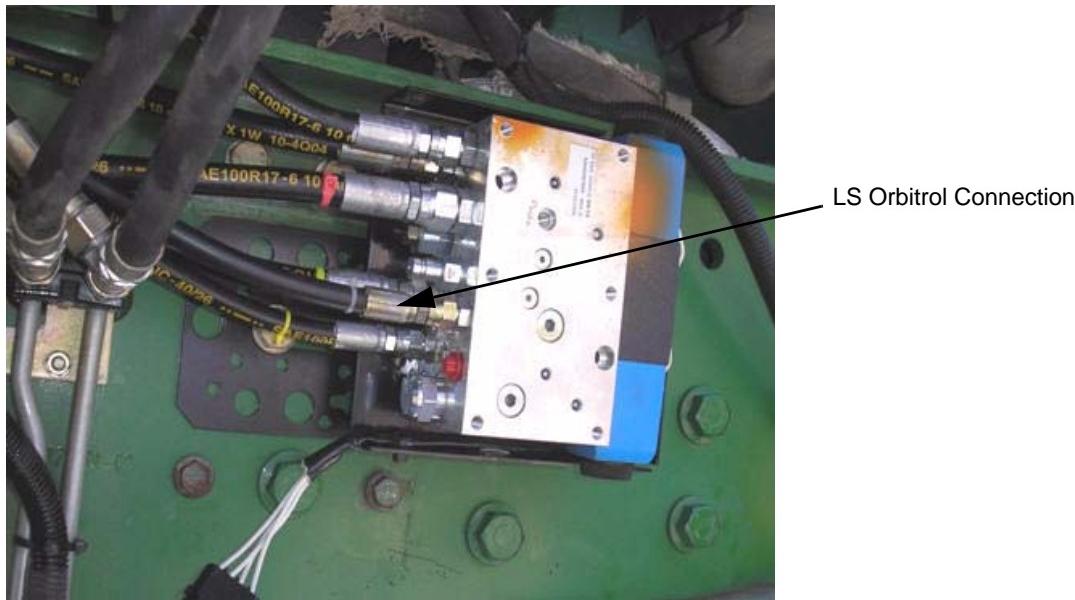


Install the Valve Bracket

Note: It is especially important to keep this hose clear of the engine belt and pulley. Secure the hose in a protected position.

6. Connect the other hose end to the LS ORBITROL port on AutoSteer valve. See *Figure 2-27*.

Figure 2-27 Steering Valve Load Sense Orbitrol Connection



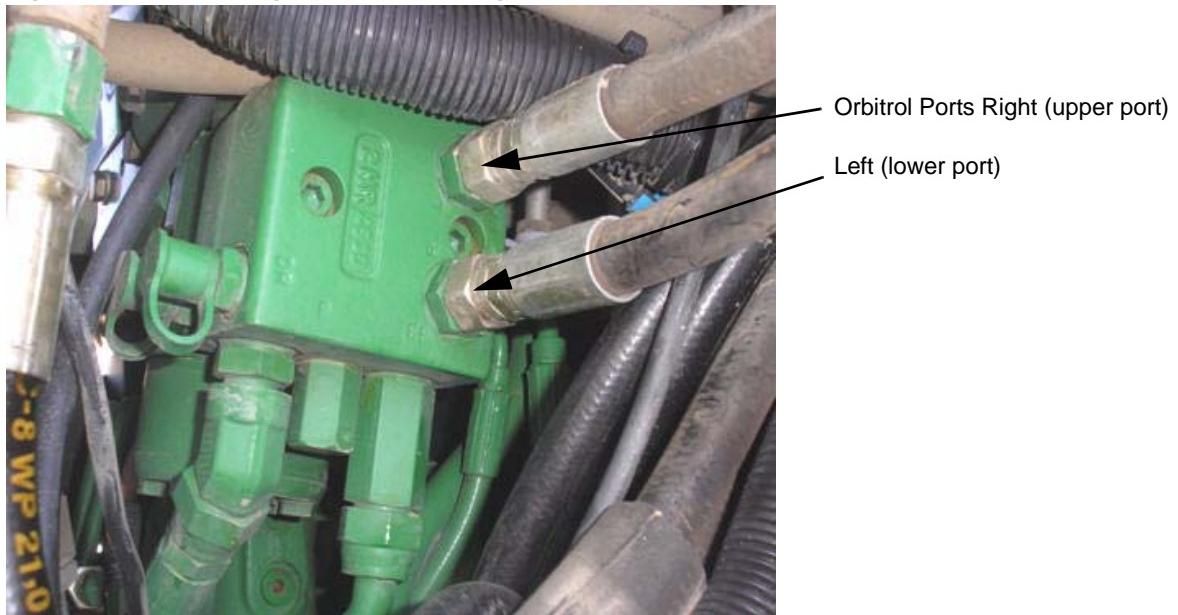
Note: The LS ORBITROL hose will provide a pressure signal to the AutoSteer pressure transducer that will kick-out AutoSteer when the steering wheel is turned.

Right Steering Hose Connection

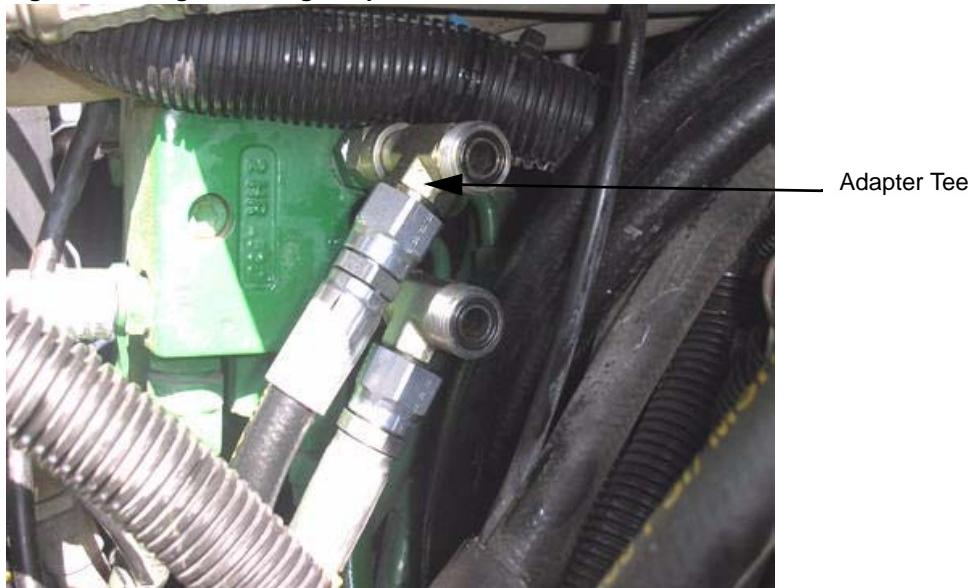
Note: Refer to *Figure 2-15* and the *Hydraulic Hose Connection Overview* for information on how to connect the hoses. The hoses must be connected in the correct order for best fit and ease of installation.

1. Identify the Right and Left ports on the Orbitrol as shown in *Figure 2-28*.

Note: These hose connections are opened to install Tee adapters for connecting the AutoSteer steering hoses.

Figure 2-28 Orbitrol Right and Left Steering Ports

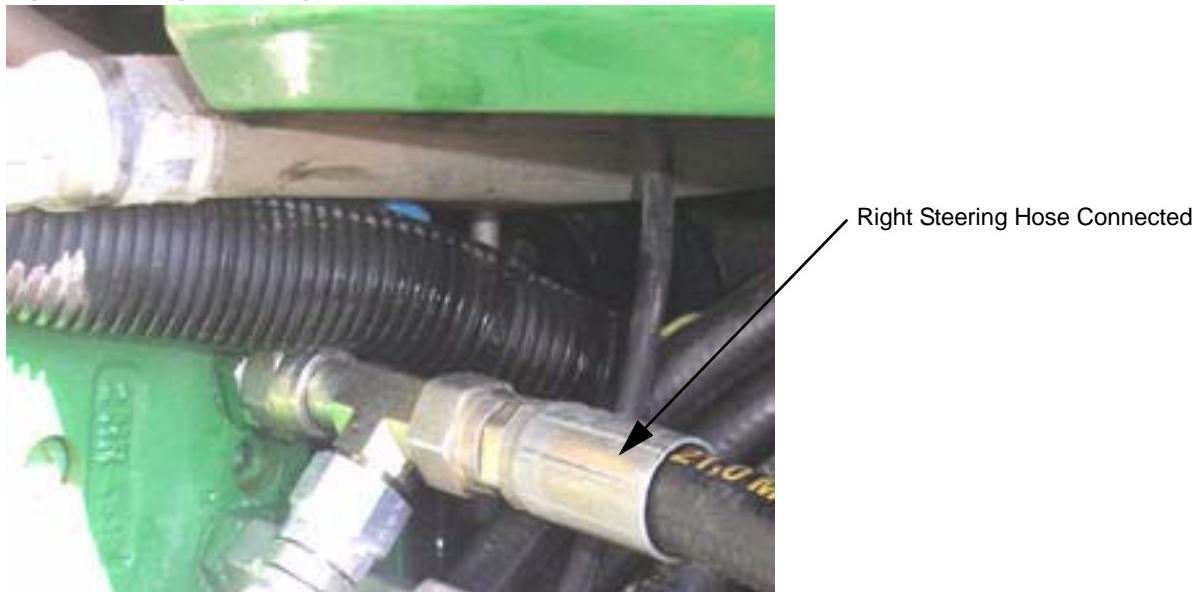
2. Install a tee adapter on the Right steering line. See *Figure 2-29*.

Figure 2-29 Right Steering Adapter Connection

3. Connect the AutoSteer right steering hose to the Orbitrol tee adapter. See *Figure 2-30*.
4. Reconnect the original hose on the Tee adapter end.

Install the Valve Bracket

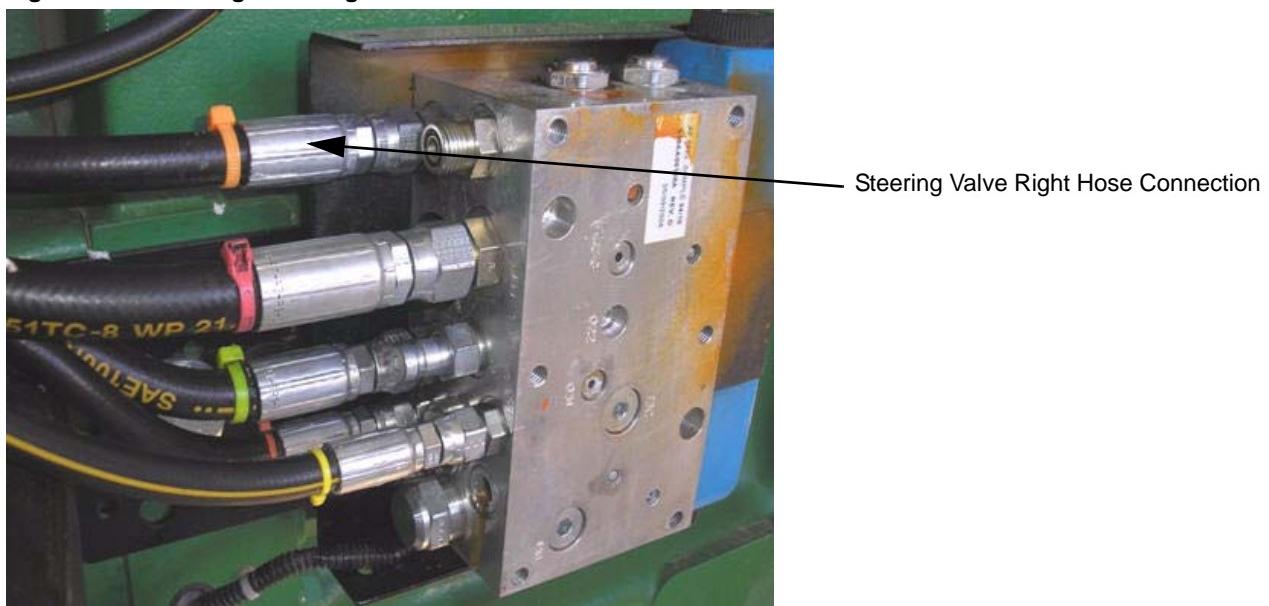
Figure 2-30 Right Steering Hose Connected



5. Connect the other end of the AutoSteer Right steer hose to the RIGHT port on the AutoSteer valve. See *Figure 2-31*.

Note: This hose connects to the RIGHT port on the AutoSteer valve. See *Figure 2-31*.

Figure 2-31 Steering Valve Right Hose Connection

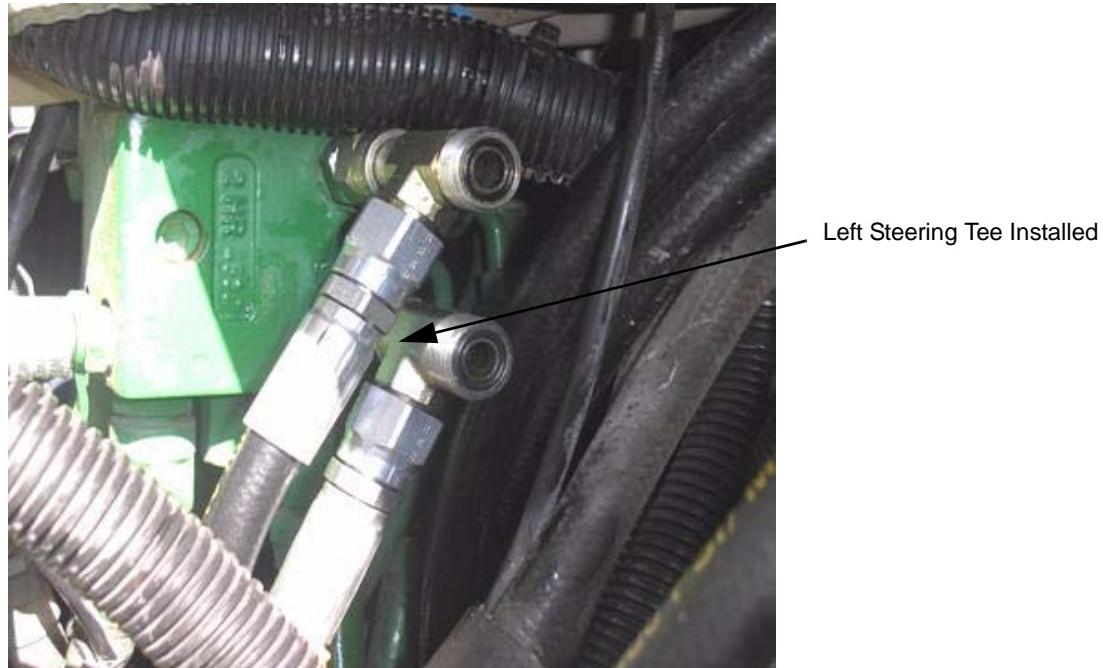


Left Steering Hose Connection

Note: Refer to *Figure 2-15* and the *Hydraulic Hose Connection Overview* for information on how to connect the hoses. The hoses must be connected in the correct order for best fit and ease of installation.

1. Install a Run Tee adapter to the Left port (bottom port) on the Orbitrol.

Figure 2-32 Orbitrol Left Steering Tee Connected



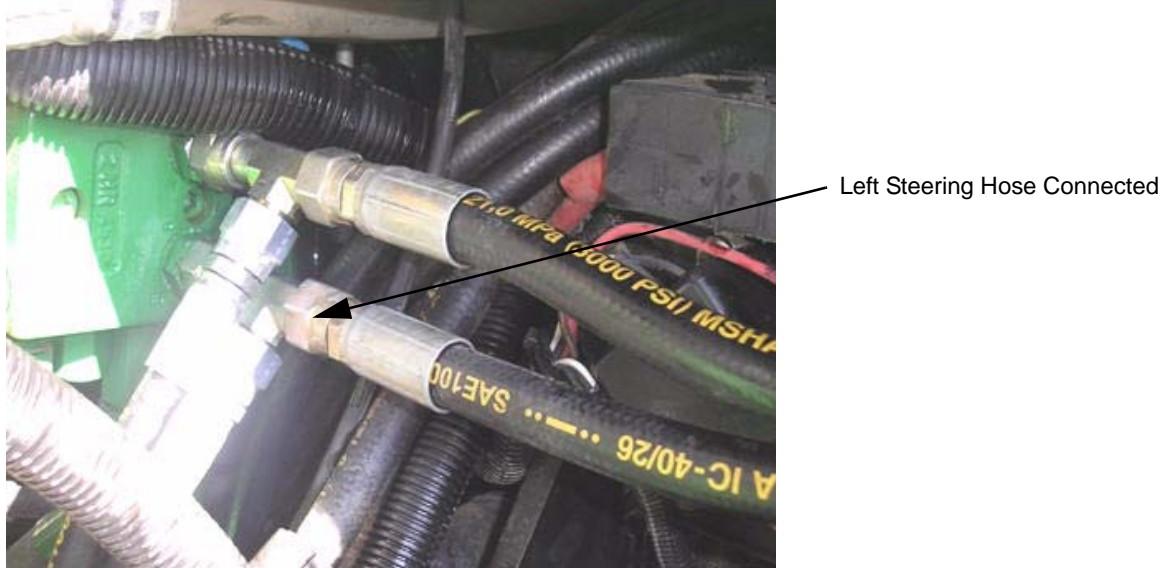
2. Connect the AutoSteer Left steering hose to the side of the tee adapter. See *Figure 2-33*.

Note: This hose will connect to the LEFT port on the AutoSteer valve.

3. Reconnect the original hose on the Tee adapter end.

Install the Valve Bracket

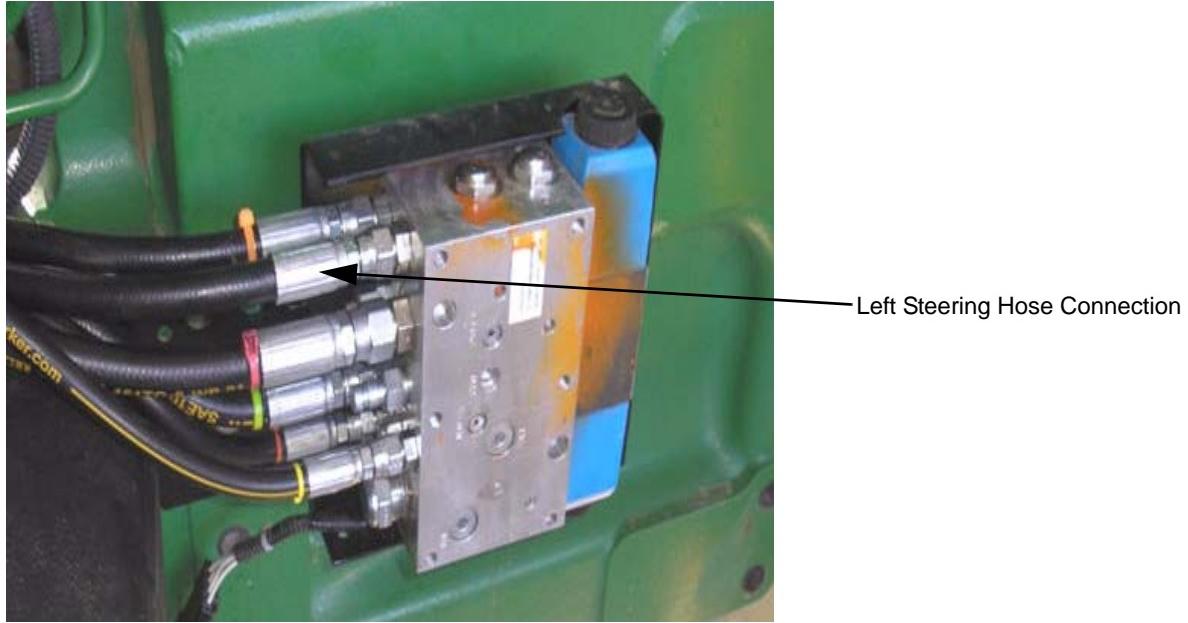
Figure 2-33 Orbitrol Left Steering Hose Connected



4. Connect the AutoSteer Left steering hose to the Steering Valve. See *Figure 2-34*.

Note: This hose connects to the LEFT port on the AutoSteer valve. See *Figure 2-34*.

Figure 2-34 Steering Valve Left Steering Connection



Note: Route all hoses to ensure they are clear of the exhaust manifold and moving parts such as belts, pulleys and engine drive shaft. Secure all hoses in a protected position using cable ties. Tighten all hose fittings and adapters.

Pressure Transducer

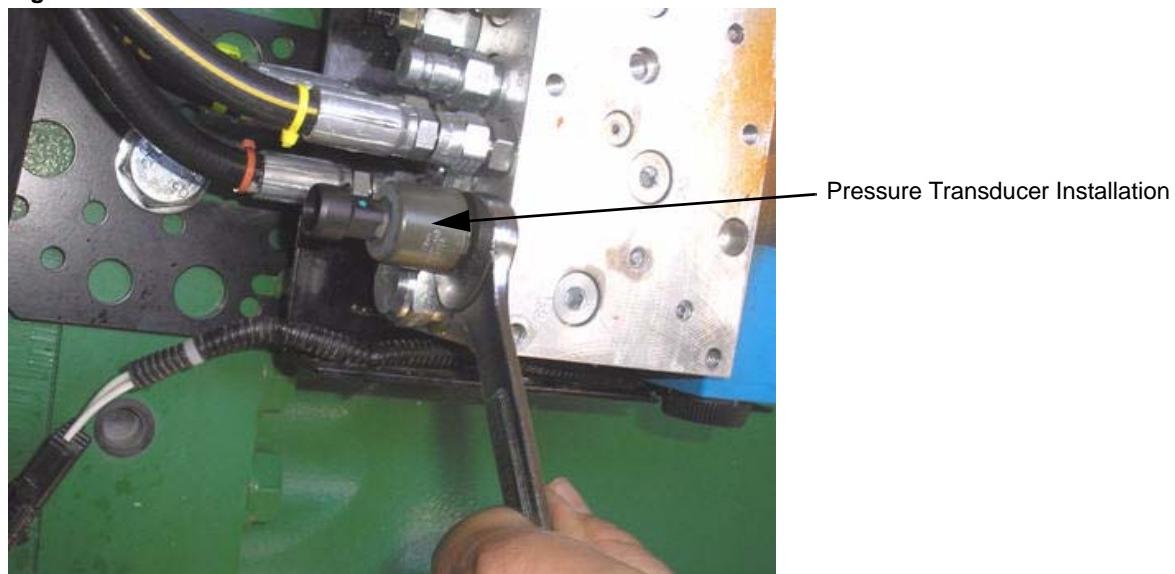
1. Install the pressure transducer on the Steering Valve TRANS port. See *Figure 2-35*.
2. Tighten the pressure transducer with a 3/4" wrench.

Note: Do not over tighten the pressure transducer.

3. Connect the short transducer harness to the transducer. See *Figure 2-35*.

Note: Loop the excess harness inside the rear cover and secure with a small cable tie on the two holes on the rear Steering Valve cover.

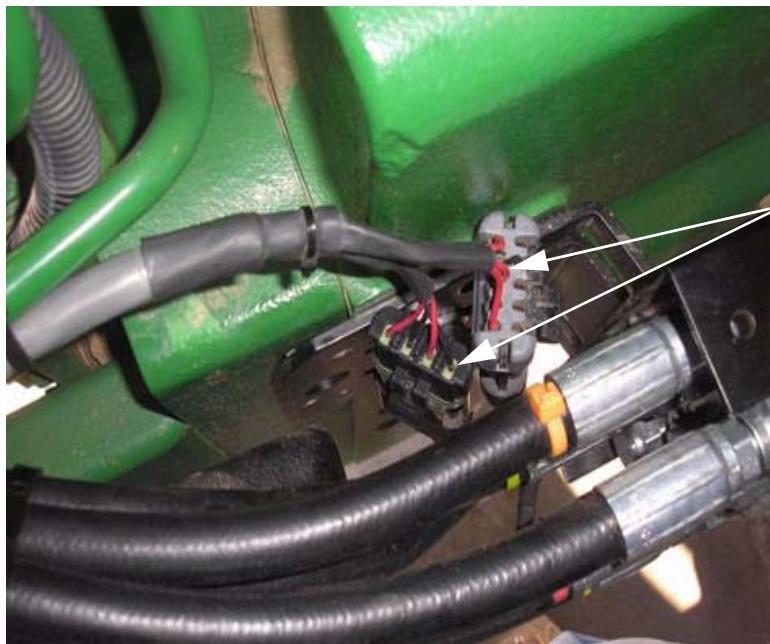
Figure 2-35 Pressure Transducer Installation



Install the Valve Bracket

4. Connect the 4-pin connector and 10-pin connector to the SA Module Harness. See *Figure 2-36*.

Figure 2-36 Pressure Transducer Cable Connection



Transducer Cable and Connectors

5. Secure the transducer harness to the rear valve cover using a small cable tie as shown in *Figure 2-37*.

Figure 2-37 Securing the Transducer Harness



Harness Cable Tie

Adjusting the Relief Valve

The steering valve has a built-in Load Sense relief valve that limits the maximum pump pressure when using AutoSteer. The relief valve must be adjusted after you have completed the hydraulic installation and the Display is fully installed and operational.

Note: The relief valve in *Figure 2-38* is shown on a bench without the hydraulic hoses connected for ease of viewing the adjustment process. When you adjust the relief valve, it is done with the valve mounted on the vehicle and the hydraulic hoses connected.

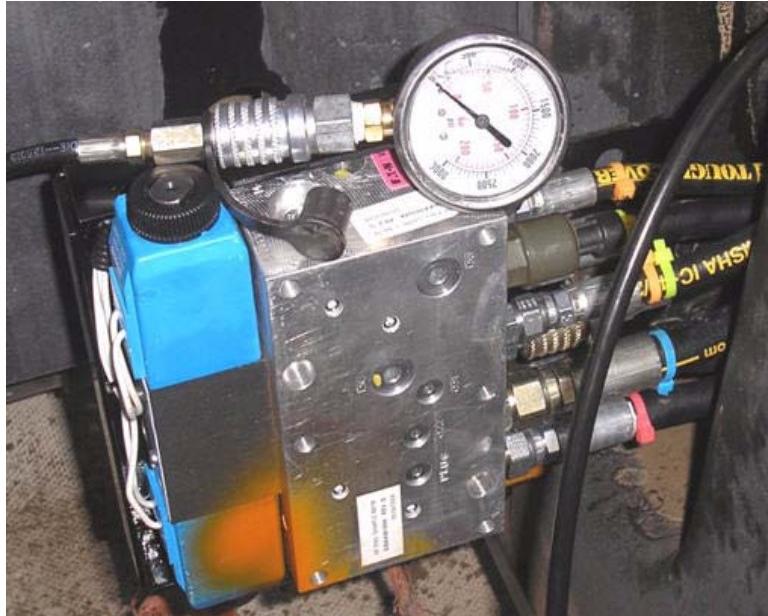
Figure 2-38 Relief Valve Adjustment



Install the Valve Bracket

1. Install a 5000 psi pressure gauge on the AutoSteer valve diagnostics port labeled as GP. Use a short extension hose on the pressure gauge if necessary for easier reading. See *Figure 2-39*.

Figure 2-39 Pressure Gauge



2. Put transmission into “neutral” or “park” position and turn on the hand brake.
3. Start the engine and leave it at low idle.
4. Immediately check for oil leaks on all hose connections that were opened.
5. Turn the steering wheel full right and then full left and check for correct manuals steering response. Immediately check for oil leaks on all hose connections that were opened. Air in the hoses may cause a slight steering delay when the system is first powered up.
6. Observe the standby pump pressure shown on your pressure gauge. Standby pressure should be very low, or around 350psi. If standby pump pressure is zero or less than 100psi, you might have inverted the Pressure and Tank hoses.
7. Clear any bystanders from around the tractor because you will be moving the front wheels in the next step.
8. With the Display turned ON access the **Hydraulic Valve** window from the **Steering Components** Window and command the steering full Right and full Left. The front wheels will turn towards each of the directional stops. The maximum pump pressure will be indicated on the pressure gauge when the wheels hit the stops.
9. Adjust the AutoSteer relief valve so that the maximum pump pressure is 2800psi when the wheels hit the stops.
10. Tighten the jam nut on the relief valve once the correct pressure setting has been adjusted.
11. Remove your pressure gauge by sliding the sleeve on the quick coupler.

Steering Valve Installation Checklist

1. Valve bracket bolt is tight.
2. Mounting screws that secure the valve are tight.
3. Pressure hose is connected to correct port on AutoSteer Valve and Power Beyond.
4. Tank hose connected to correct port on AutoSteer valve and Power Beyond.
5. LS-OUT hose connected to correct port on the AutoSteer valve and Load Sense on Power Beyond.
6. LS ORBITROL hose connected to correct ports on Orbitrol.
7. Right steer hose connected correctly at both ends.
8. Left steer hose connected correctly at both ends.
9. Pressure transducer installed and tight.
10. Checked that all hose fittings are tight.
11. Checked hose routing and cable ties on all hoses.
12. SA Module Harness connected to the two valve connectors.
13. 5000psi pressure gauge is installed on the valve test port.

Install the Valve Bracket

Wheel Angle Sensor (WAS) Installation

This **Wheel Angle Sensor Installation** chapter information is provided in the following sections:

- *JD-8020 MFWD Wheel Angle Sensor Installation Procedure*
- *JD-8020 ILS Wheel Angle Sensor Installation Procedure*
 - *John Deere 8020 ILS Wheel Angle Sensor Installation Verification*

Note: The Wheel Angle Sensor is optional equipment and is not provided with the installation kit. The Wheel Angle Sensor installation instructions are provided for special installations, when required.

JD-8020 MFWD Wheel Angle Sensor Installation Procedure

1. Identify the differential bolts on the right side of the front axle as shown in *Figure 3-1*.

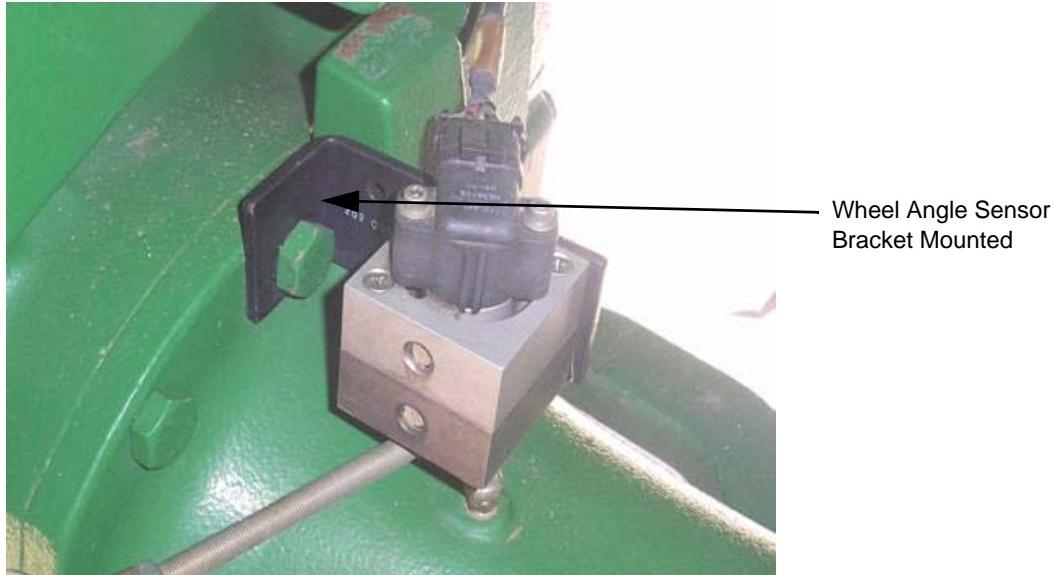
Figure 3-1 Differential Bolts



Differential Bolt used
for the Wheel Angle
Sensor Bracket

2. Install the Wheel Angle Sensor “L” bracket on the right side of the front axle in the position shown in *Figure 3-2*.
3. Secure with an existing bolt on the differential housing.

Figure 3-2 Wheel Angle Sensor Bracket Mounted



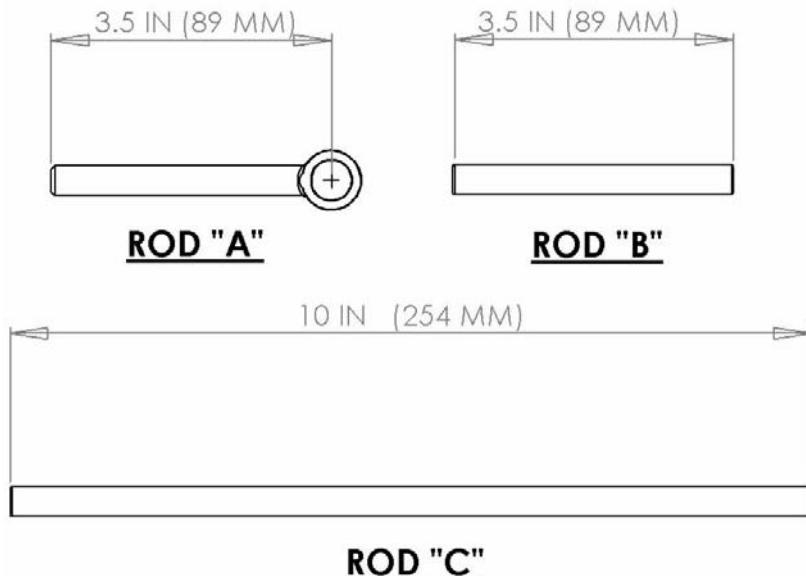
Note: The threaded linkage rods must be cut to the correct lengths before final assembly. The linkage rods are shown assembled in *Figure 3-2*. See *Table 3-1* and *Table 3-2* for the cut and assembled linkage rod lengths.

4. Measure and mark the two rods for cutting, according to the length shown in *Table 3-1*.

Note: *Figure 3-3* shows the measurement points used to properly cut the linkage rods.

Table 3-1 Linkage Rod Cut Lengths

Item	Length
Rod A	3.5 inches (89 mm)
Rod B	3.5 inches (89 mm)
Rod C	10.0 inches (254 mm)

Figure 3-3 Linkage Rod Cut Length Measurement Points

5. Use a hack saw to cut the linkage rod to length while it is held in a bench vise. See *Figure 3-4*.

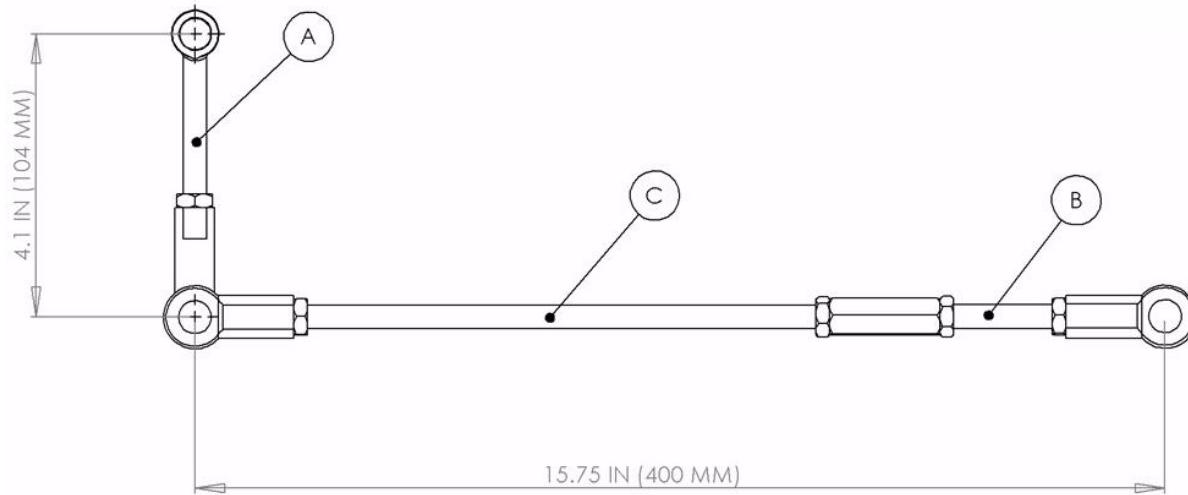
Figure 3-4 Linkage Rod Cutting

Note: The “after-assembly” center-to-center lengths of each linkage rod are shown in *Table 3-2*. *Figure 3-5* shows the measurement points for the assembled linkage rods.

Table 3-2 Assembled Linkage Rod Length

Item	Length
Rod A	4.1 inches (105 mm)
Rod B + Rod C	15.75 inches (400 mm)

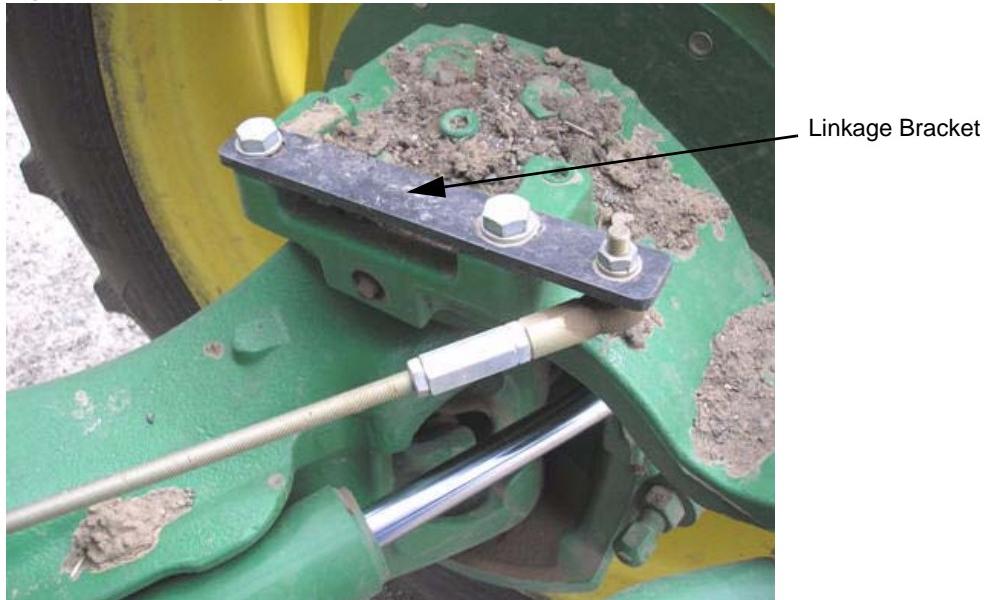
Note: Rod B and Rod C are connected using the union nut and jam nuts included in your kit.

Figure 3-5 Linkage Rod (Assembled) Measurement Points

Note: The threaded rods must be cut to the correct lengths before final assembly.

6. Install the linkage bracket on the right side knuckle in the position shown in *Figure 3-6*.

Note: You may secure using two M12 hex bolts on the existing axle threads or you may secure using the smaller hex bolts with nuts.

Figure 3-6 Linkage Bracket

7. Install the threaded linkage rods as shown.

Note: The threaded rods must be cut to the correct lengths before installing on the tractor. See cutting instructions starting with *Step 4.* for details.

8. Install the short linkage arm on the Wheel Angle Sensor shaft.
9. Install the long threaded linkage on the tie rod bracket using a ball joint.

Note: The long linkage rod is assembled from the two threaded rods plus a union nut and jam nuts.

10. Tighten all jam nuts on the threaded rods.
11. Tighten the bolt securing the two linkage rods together. See *Figure 3-7.*

Figure 3-7 Linkage Rod Ball Joint Bolt



12. Tighten the two screws that secure the potentiometer on the Wheel Angle Sensor, after final adjustments. Use a 5/32" hex key and a 3/8" wrench. See *Figure 3-8*.

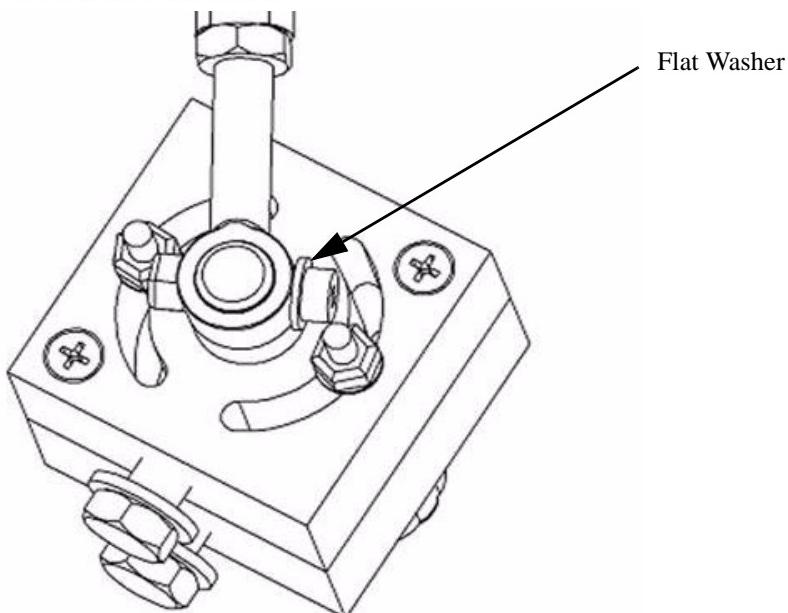
Figure 3-8 Wheel Angle Sensor Potentiometer



Note: Do not turn the front wheels or drive the tractor before the Wheel Angle Sensor has been fully adjusted using the AutoSteer Calibration screens. The potentiometer can only rotate a maximum of 180 degrees and if it is rotated beyond its mechanical stops, it will be permanently damaged.

13. Ensure a flat washer is placed under the screw head when attaching the linkage rod to the sensor shaft. See *Figure 3-9*.

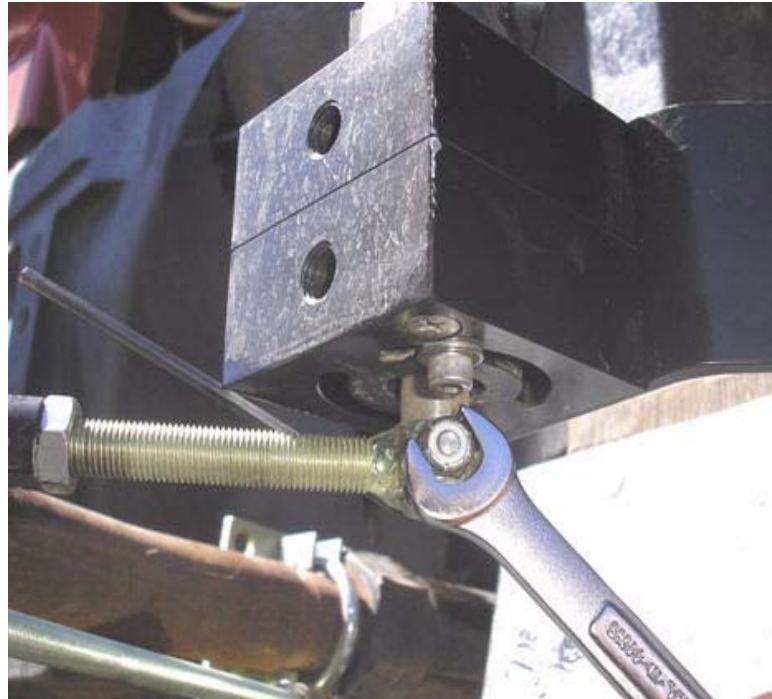
Figure 3-9 Washer on Shaft Screw



Note: The washer should be on the bolt head side and not the nut side of the assembly.

14. Tighten the screw on the sensor shaft. Use a 1/8" hex key and a 3/8" wrench. See *Figure 3-10*.

Figure 3-10 Wheel Angle Sensor Shaft Tightening



15. Secure the cable along the bracket top using cable ties, after the SA Module Harness is installed.

Note: The AutoSteer system must be fully functional before you can perform *Step 16*.

16. Adjust the arm length until you get at least 3000 counts from the Wheel Angle Sensor.

Note: If necessary, shorten Rod A to increase the Wheel Angle Sensor counts.

17. Tighten all jam nuts and fasteners.

18. *Figure 3-11 shows the completed Wheel Angle Sensor installation.*

Figure 3-11 Wheel Angle Sensor Installed



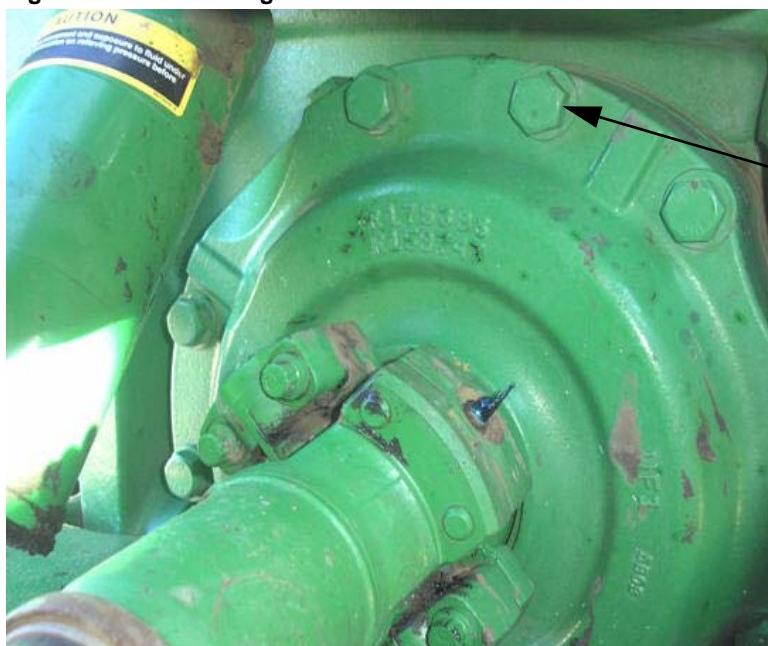
JD-8020 ILS Wheel Angle Sensor Installation Procedure

1. Identify the bolts that secure the left drive shaft on the front axle. The bolt shown in *Figure 3-12* is used to secure the AutoSteer Wheel Angle Sensor.

Note: The bolt is the first one to the right of the top of the driveshaft cover. See *Figure 3-12*.

Note: Mounting the bracket on the wrong bolt will result in improper linkage geometry and may cause linkage interference or linkage over-extension.

Figure 3-12 Wheel Angle Sensor Bracket Drive Shaft Bolt



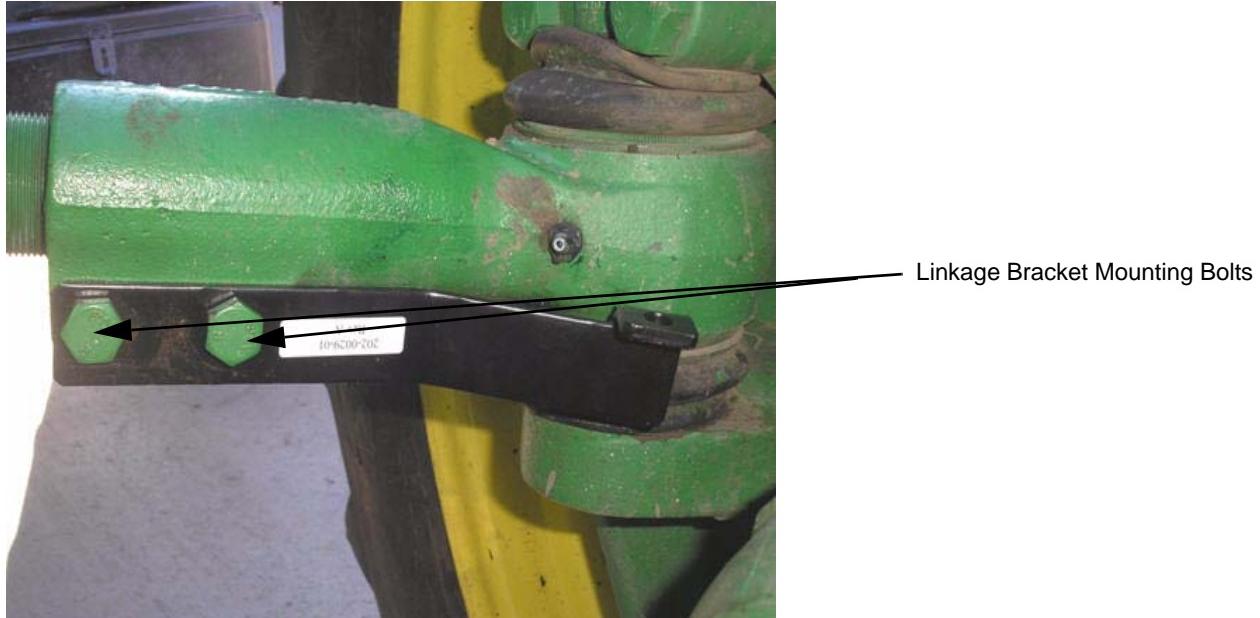
2. Mount the Wheel Angle Sensor bracket. Secure with an existing bolt on the differential housing. See *Figure 3-13*.
3. Install the Wheel Angle Sensor on the bracket as shown in *Figure 3-13*. Torque the bolt to 229 Ft-Lbs (310 Nm).

Note: The threaded linkage rods must be cut and adjusted to the correct lengths before final assembly. The linkage rods are shown assembled in *Figure 3-26*. See *Table 3-3* and *Table 3-4* for the cut and assembled linkage rod lengths.

Figure 3-13 Wheel Angle Sensor Bracket Mounted

4. Install the linkage bracket on the tie rod in the position shown *Figure 3-14*. Torque the bolts to 90 Ft. Lbs. (125 Nm).
5. Install the pre-assembled linkages and secure at both ends as shown in *Figure 3-14*.

Note: The threaded rods can be cut to the correct lengths and the linkage rods assembled prior to attaching the linkage rod and Wheel Angle Sensor to their brackets.

Figure 3-14 Linkage Bracket Mounted

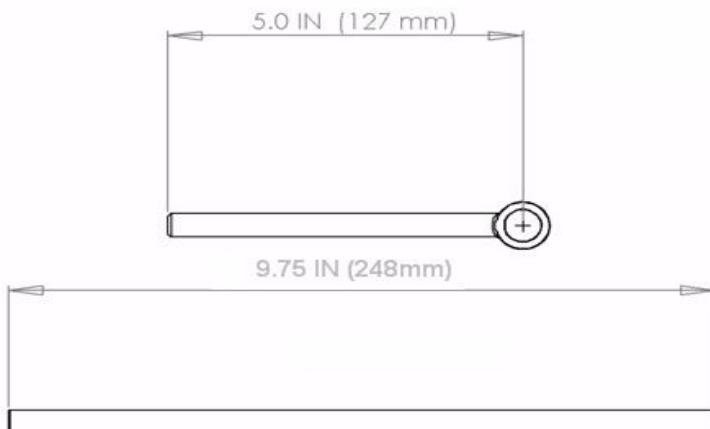
6. Measure and mark the two rods for cutting, according to the length shown in *Table 3-3*.

Note: *Figure 3-15* shows the measurement points used to properly cut the linkage rods.

Table 3-3 Linkage Rod Cut Lengths

Item	Length
Rod A	5.0 inches (127 mm)
Rod B	9.75 inches (248 mm)

Figure 3-15 Linkage Rod Cut Length Measurement Points



7. Use a hack saw to cut the linkage rod to length while it is held in a bench vise. See *Figure 3-16*.

Figure 3-16 Linkage Rod Cutting

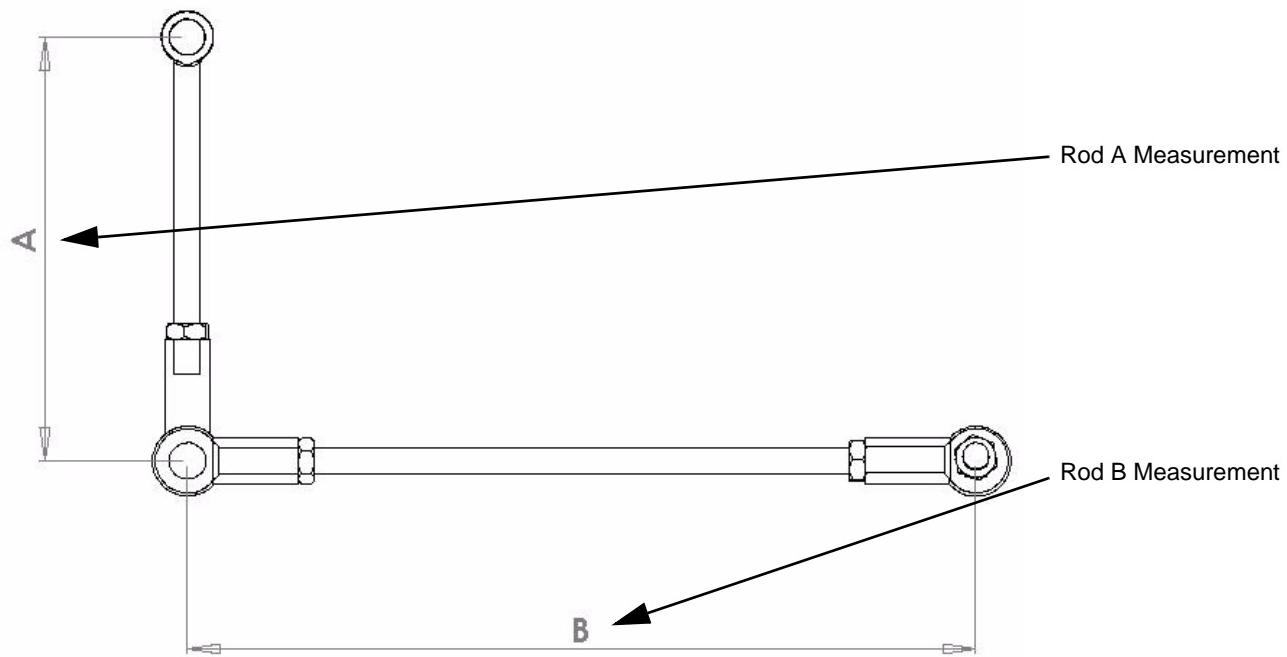


Note: The “after-assembly” center-to-center lengths of each linkage rod are shown in *Table 3-4*. *Figure 3-17* shows the measurement points for the assembled linkage rods.

Table 3-4 Assembled Linkage Rod Length

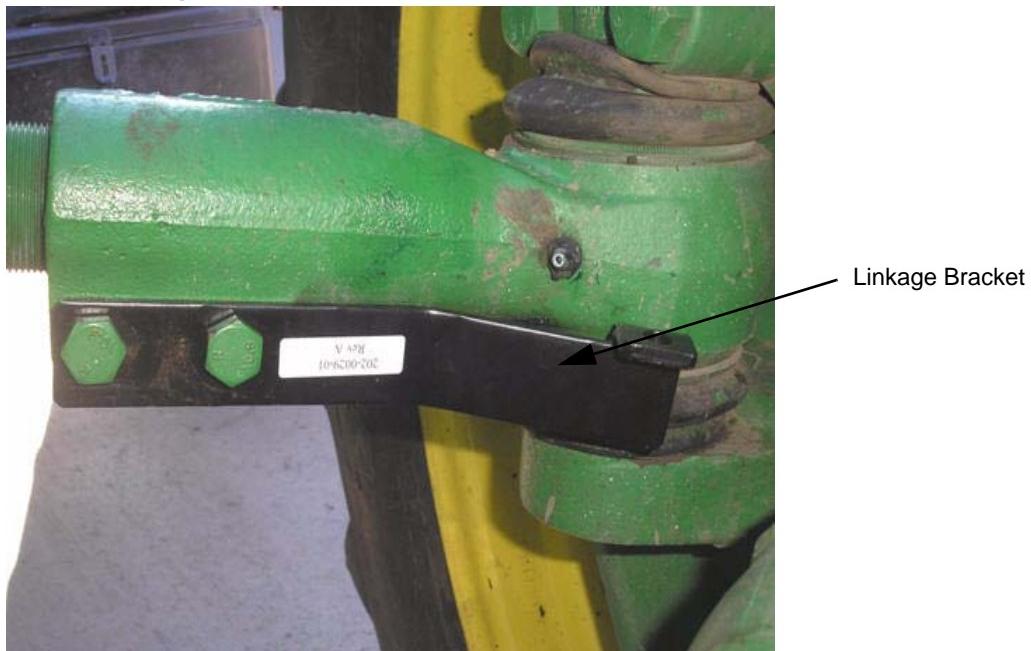
Item	Length
Rod A	5.9 inches (150 mm)
Rod B	11.5 inches (292 mm)

Figure 3-17 Linkage Rod (Assembled) Measurement Points



Note: The threaded rods must be cut to the correct lengths before final assembly.

8. Install the Wheel Angle Sensor on the bracket end, as shown in *Figure 3-18*.
9. Install the bracket on the right-side tie rod as shown in *Figure 3-18*. Secure to the tie rod using the clamp provided in the kit.

Figure 3-18 Linkage Bracket Mounted

10. Install the short linkage arm on the Wheel Angle Sensor shaft. See *Figure 3-19*.
11. Secure the linkage rod on the Wheel Angle Sensor shaft using the screw and nut provided.
12. Install the ball joint on the end of the arm in the position. See *Figure 3-19*.

Note: The ball joint must be pointing upwards as shown *Figure 3-19*.

Figure 3-19 Connecting Short Linkage Rod to the Wheel Angle Sensor



13. Install the long threaded linkage on the tie rod bracket using a ball joint.
14. The ball joints on both ends will accommodate the suspension movement and steering movement.

Figure 3-20 Connecting Long Linkage Rod to Tie Rod Bracket



15. Tighten all jam nuts on the threaded rods.

16. Tighten the bolt securing the two linkage rods together. See *Figure 3-21*.

Figure 3-21 Linkage Rod Ball Joint Bolt



17. Tighten the two screws that secure the potentiometer on the Wheel Angle Sensor, after final adjustments. Use a 5/32" hex key and a 3/8" wrench. See *Figure 3-22*.

Figure 3-22 Wheel Angle Sensor Potentiometer (different vehicle shown)

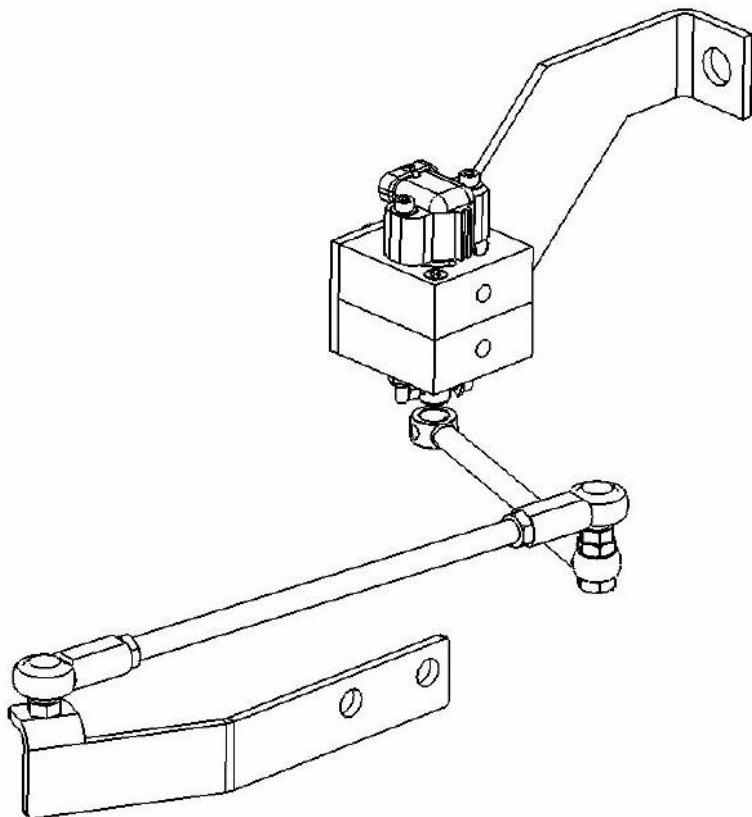


Note: Do not turn the front wheels or drive the tractor before the Wheel Angle Sensor has been adjusted using the AutoSteer Calibration screens. The potentiometer can only rotate a maximum of 180 degrees and if it is rotated

beyond its mechanical stops, it will be permanently damaged.

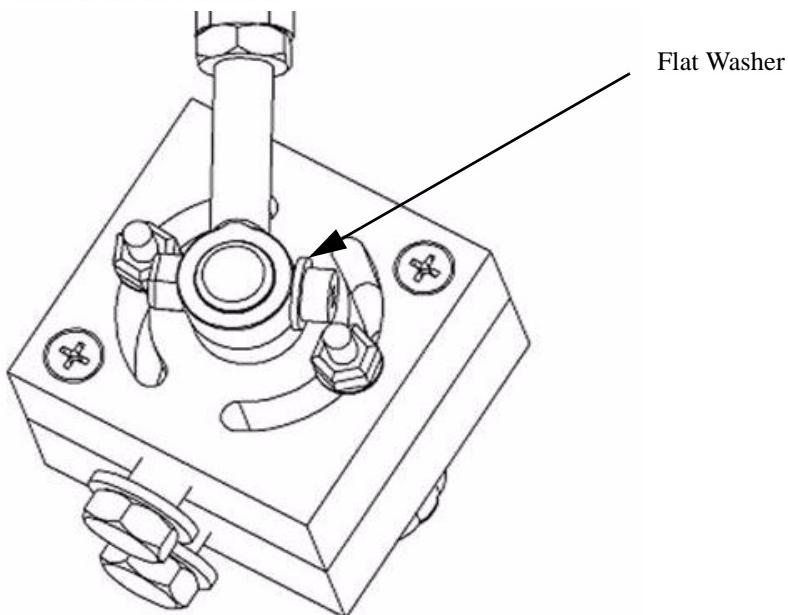
Figure 3-23 shows a line drawing of the fully assembled Wheel Angle Sensor.

Figure 3-23 Wheel Angle Sensor Assembly Fully Assembled



- 18.** Ensure a flat washer is placed under the screw head when attaching the linkage rod to the sensor shaft. See *Figure 3-24*.

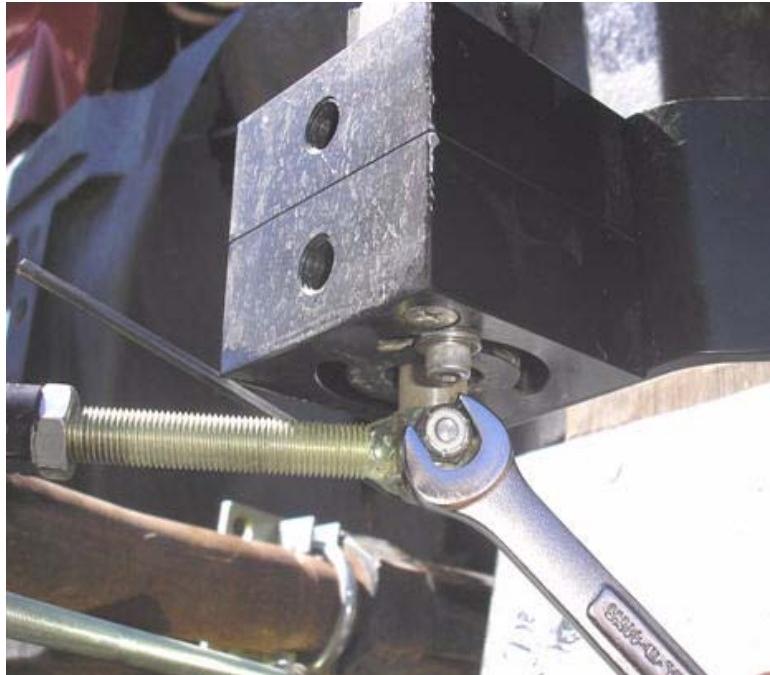
Figure 3-24 Washer on Shaft Screw



Note: The washer should be on the bolt head side and not the nut side of the assembly.

- 19.** Tighten the screw on the sensor shaft. Use a 1/8" hex key and a 3/8" wrench. See *Figure 3-25*.

Figure 3-25 Wheel Angle Sensor Shaft Tightening



- 20.** Secure the cable along the bracket top using cable ties, after the SA Module Harness is installed.

- 21.** Tighten all jam nuts and fasteners.

22. Figure 3-26 shows the completed Wheel Angle Sensor installation.

Note: The correct linkage rod lengths must be checked by moving the front wheels full left and full right with the front ILS suspension in the maximum top and maximum bottom positions. Refer to the John Deere documentation provided with your vehicle for instructions on raising and lowering the ILS suspension.

Figure 3-26 Wheel Angle Sensor Installed



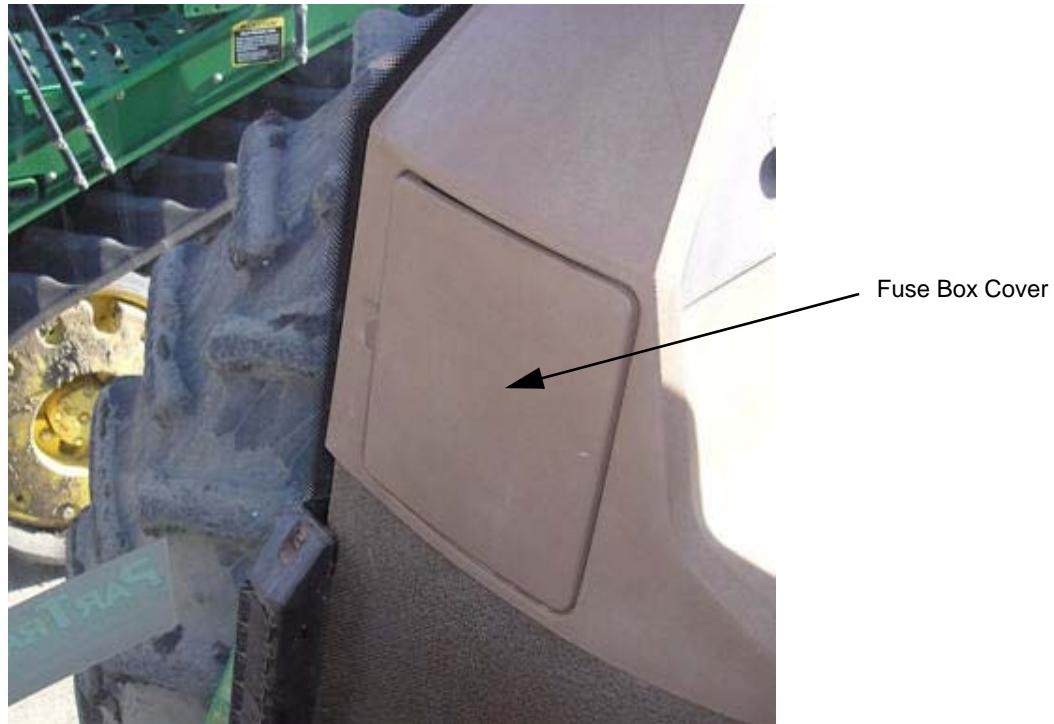
John Deere 8020 ILS Wheel Angle Sensor Installation Verification

After installing the AutoSteer Wheel Angle Sensor, you must check the free movement of the linkages by moving the front wheels from full left to full right with the tractor's ILS suspension in the level position, top position and low position. The following instructions provide the procedure for moving the suspension up and down from within the cab. These instructions are provided for reference. We recommend that you refer to your tractor owners manual or service manual for full ILS suspension movement details.

Note: These instructions refer only to the JD-8020 ILS series tractors. Newer JD-8030 ILS series vehicles have a slightly different procedure for moving the ILS suspension. Refer to your tractor owners manual or service manual for details.

1. Turn off the engine. Ensure the headlight, high beam and hazard light switches are turned off.
2. Identify the fuse box cover on the right side of the cab. See *Figure 3-27*.

Figure 3-27 Fuse Box Cover



3. Remove the fuse box cover.

Note: The fuse box cover has a diagram that helps identify all the fuses. See *Figure 3-28*.

Figure 3-28 Fuse Box Map

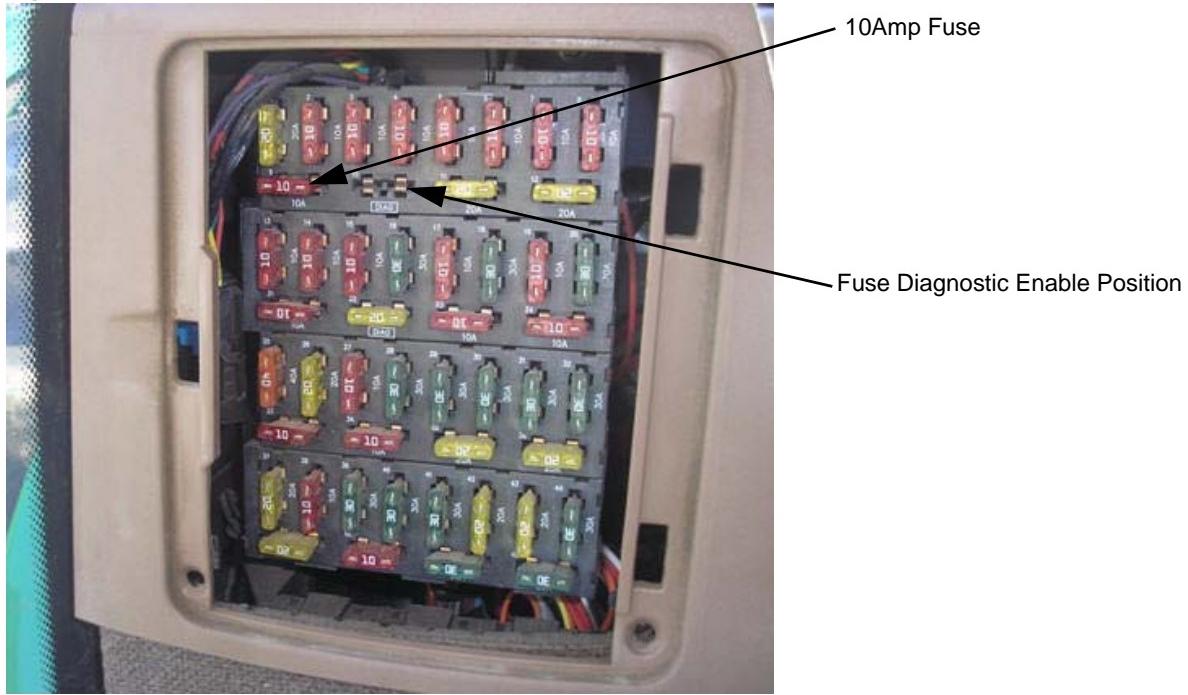


4. Remove the 10A fuse shown in *Figure 3-29*.

Note: The engine and lights must be turned off before you move the fuse. The procedure will not work and will not enable the ILS suspension movement if you move the fuse with the engine running or the lights turned on.

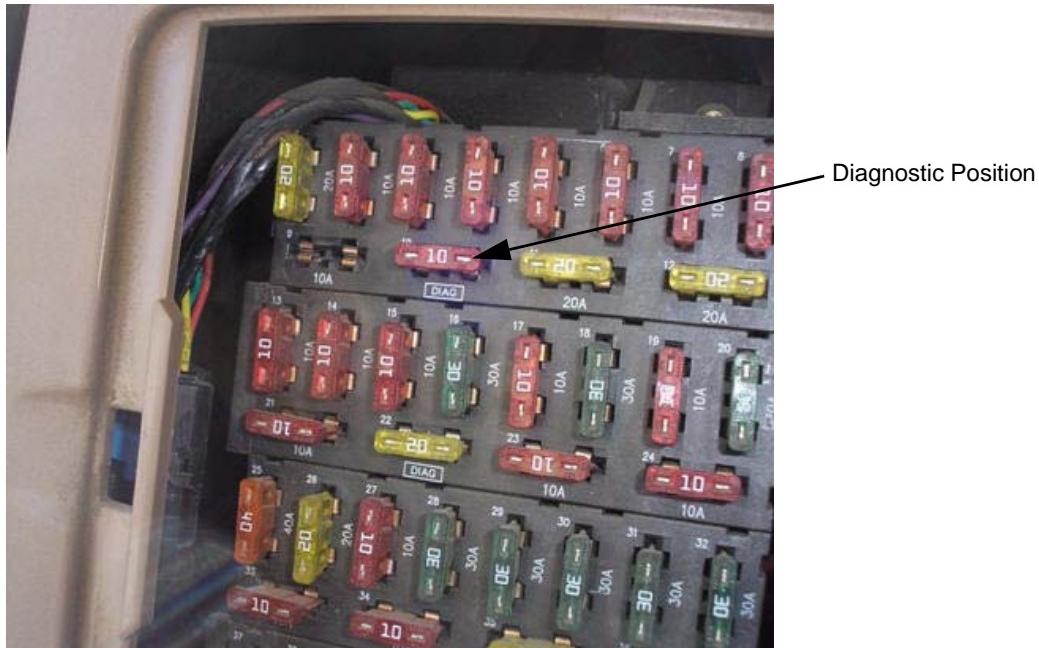
Note: Moving the fuse to the DIAG position puts the tractor screen into the diagnostic mode and enables the front suspension up-down movement.

Figure 3-29 Fuse Removal



5. Move the fuse to the fuse position identified as "DIAG".

Figure 3-30 Fuse in the Diagnostic Position



6. Turn on the engine with the vehicle transmission in park.

7. “DIA” will appear on the screen as shown in *Figure 3-31*.

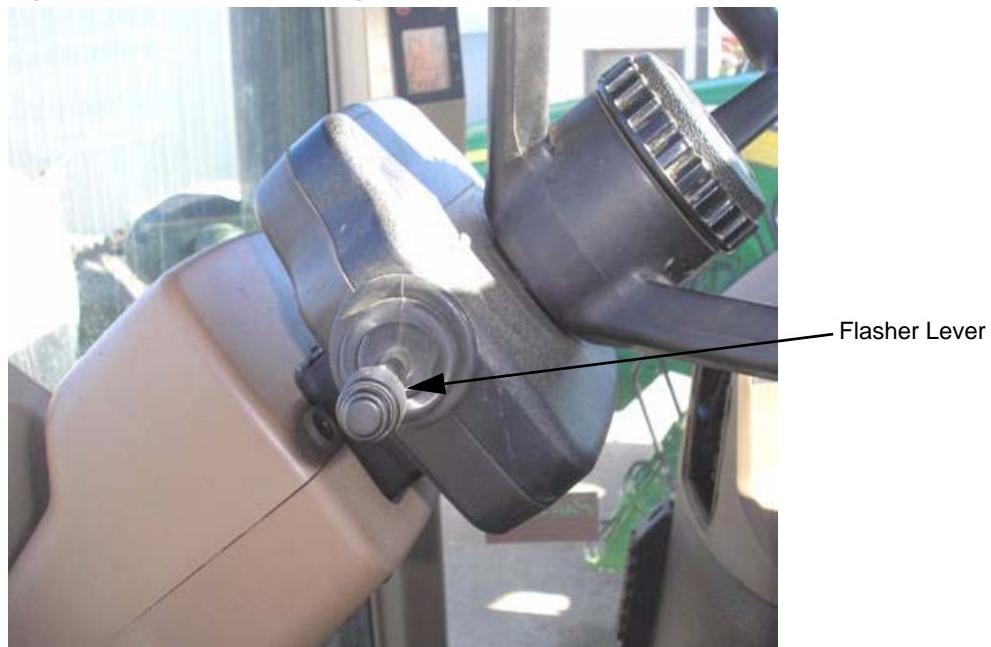
Figure 3-31 Diagnostic Status Message on Screen



8. Lift the flasher lever upwards on the left side of the steering wheel until the Display changes to “EHO”. See *Figure 3-32*.

Note: The Display moves through several different messages before reaching the “EHO” screen. You may move the lever in steps to scroll through the Display.

Figure 3-32 Flasher Lever Diagnostic Display Control



9. EHO is displayed on the bottom and “ - - ” appears in the middle of the screen. See *Figure 3-33*.

Figure 3-33 Diagnostic Screen Displaying EHO



10. Pull the flasher lever on the left side towards you then up to scroll through the numbers until “20” is displayed. See *Figure 3-34*.

Note: Moving the lever up increases the number while moving it down decreases the number.

Figure 3-34 Moving Flasher Lever to Change Values



11. In *Figure 3-35*, the number has been changed to “20” and “SC 1” is displayed on the bottom.

Note: SC 1 = Selective Control #1

Figure 3-35 Selective Control 1 Displayed



12. Toggle the red hazard switch once on the right side console to activate the SCV lever for moving the front suspension. See *Figure 3-36*.

Figure 3-36 Hazard Switch SVR Lever Activation



13. Wait a few seconds while the tractor system performs a calibration routine.

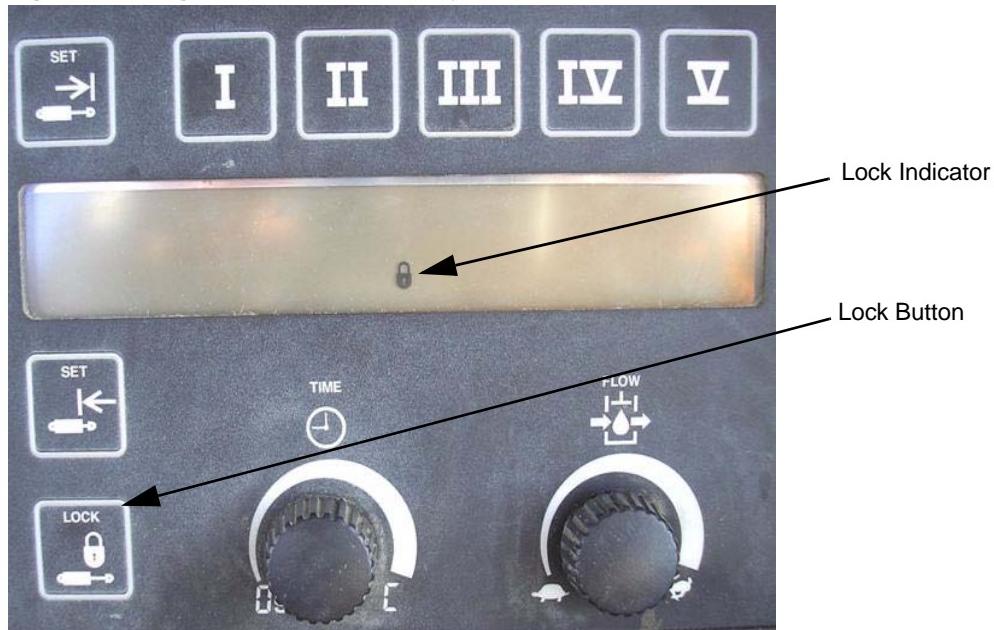
Note: The Display will show “END” when the calibration routine is finished. See *Figure 3-37*. Once “END” is displayed, you may move the front ILS suspension up and down. See *Step 14*.

Figure 3-37 Calibration Routine END Status



Note: The Display on the right side console should show a small lock after *Step 12*. is completed. The front suspension cannot be moved if the lock does not appear. You may turn the lock ON by pressing the lock button on the panel shown in *Figure 3-38*.

Figure 3-38 Right Side Console Display



14. Move the front ILS suspension up and down by moving the SCV #1 control lever on the armrest. See *Figure 3-39*.

Note: The lever must be pushed until it “clicks” to move the suspension.

Figure 3-39 Arm Rest Control Lever



Note: Forward detent is DOWN and back detent is UP.

Note: The Display on the right cab post displays “UP” while the suspension is rising and displays “DN” while the suspension is lowering. When the suspension is not moving it may display “PAU.”

- 15.** Move the suspension to the full DOWN position and slowly turn the wheels full right and then full left while observing the movement of the linkage rods.

Note: The linkage rods should move freely without binding, touching other parts or over extending. *Figure 3-40* and *Figure 3-41* show the Full Down/Full Left and Full Down/Full Right respectively.

- 16.** Adjust the linkage rod lengths as necessary to obtain free movement without interferences.

Figure 3-40 ILS Suspension Full Down and Full Left



Figure 3-41 ILS Suspension Full Down and Full Right



17. Move the suspension to the full UP position and slowly turn the wheels full right and then full left while observing the movement of the linkage rods.

Note: The linkage rods should move freely without binding, touching other parts or over extending. *Figure 3-42* and *Figure 3-43* show the Full Up/Full Left and Full Up/Full Right respectively.

18. Adjust the linkage rod lengths as necessary to obtain free movement without interferences.

Figure 3-42 ILS Suspension Full Up and Full Left



Figure 3-43 ILS Suspension Full Up and Full Right



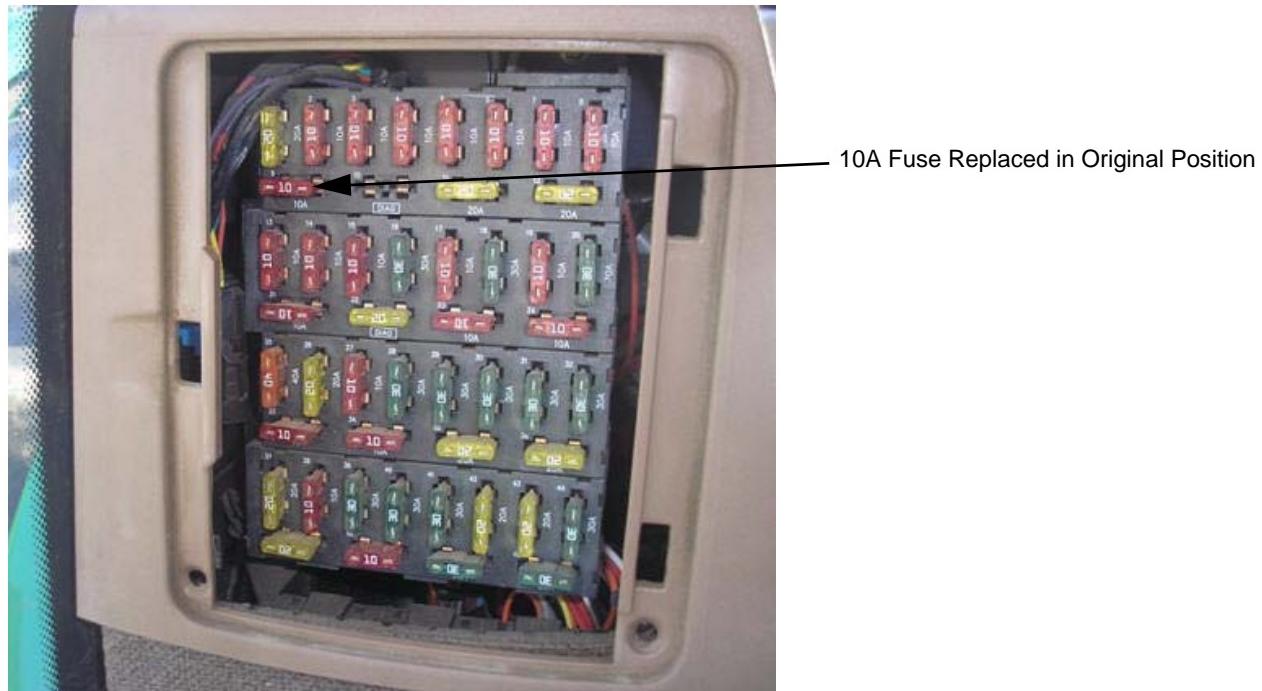
19. Move the suspension to the mid travel position before exiting the suspension diagnostic mode.

Note: The suspension will be in the middle position when the suspension arms are approximately horizontal.

Note: The ILS suspension may be operated in Automatic mode or it may be turned off if no motion of the front suspension is desired. Refer to your tractor manual for full details on correct ILS operation.

20. Turn off the engine and move the fuse to its original position by moving it from “DIAG” to “10A”.

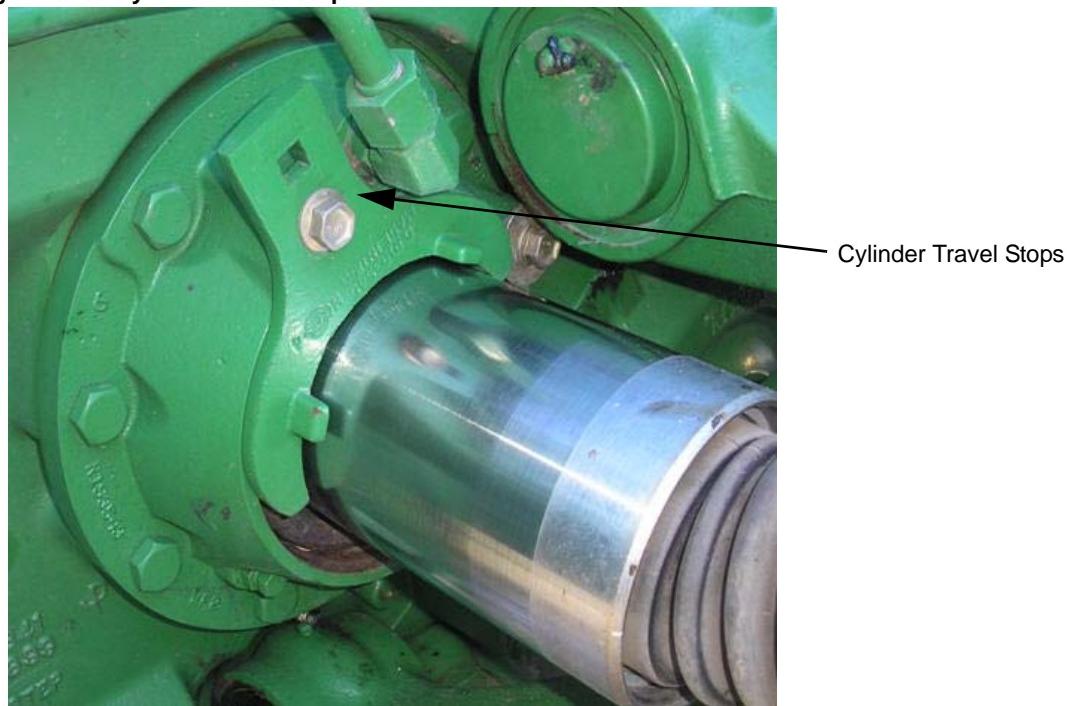
Figure 3-44 10 A Fuse Replaced to Original Position



21. Once the fuse has been moved, the tractor may be operated normally and you may proceed with the AutoSteer installation.

Note: The cylinder travel stops can be adjusted to change the steering angle of the front wheels using the special tool that is bolted to the tractor as shown in *Figure 3-45*. Refer to your tractor dealer or tractor service manual for details.

Figure 3-45 Cylinder Travel Stops



SA Module Installation

The **SA Module Installation** chapter contains information in the following sections:

- *SA Module Mounting Orientation*
- *Mount the SA Module*

SA Module Mounting Orientation

The SA Module can also only be mounted in certain orientations. *Figure 4-1* shows the correct mounting positions and *Figure 4-2* shows incorrect mounting positions.

Figure 4-1 Correct SA Module Mounting Orientations

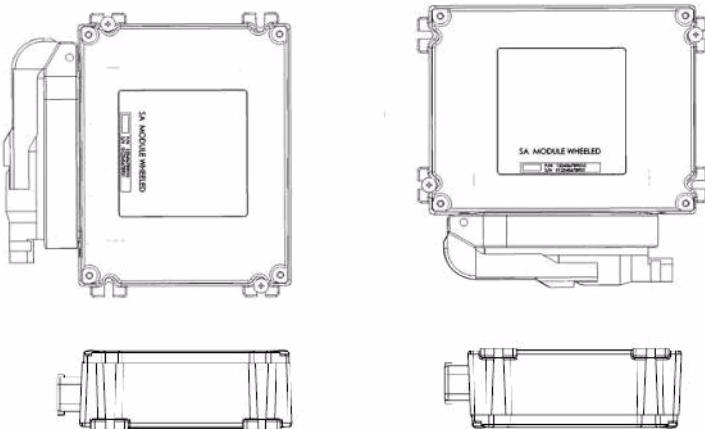
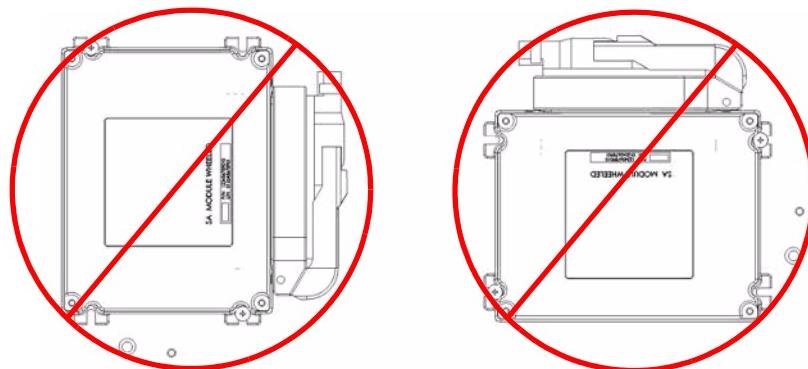


Figure 4-2 Incorrect SA Module Mounting Orientations



Mount the SA Module

Due to the variety of options available on vehicles and the possible configuration differences, it may be necessary to install the SA Module in location other than the example shown here. If an alternative location is required, choose a location where the SA Module can be protected from damage from moving parts or crop debris and excessive moisture from weather and cleaning equipment.

Note: The SA Module Harness must be routed in a protected position to avoid damage from the moving parts.

Note: The SA Module may be installed in other locations on the vehicle that are more protected from high crops such as corn or cotton.

Figure 4-3 shows rear view of tractor and the green plastic cover just below the rear window that must be removed to install the SA Module.

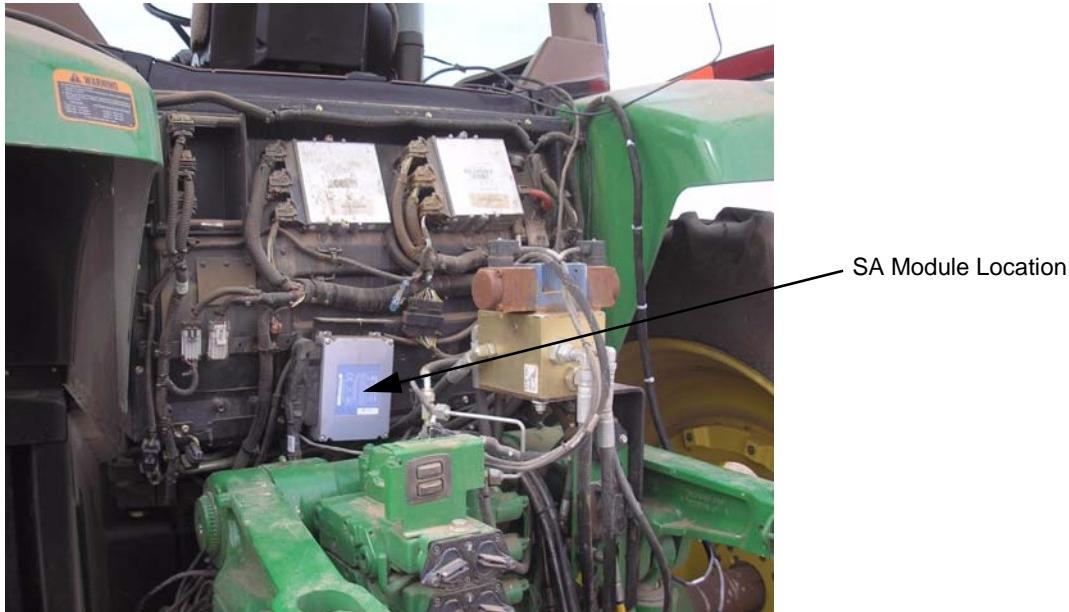
Figure 4-3 Rear Plastic Cover



1. Loosen the two hex screws connecting the panel sides with the fenders.

Note: The screws are located behind the tire, inside the rear fenders.

A good location for the SA Module installation is shown in *Figure 4-4*.

Figure 4-4 SA Module Location

SA Module Location

2. Use a hex bolt to secure the bracket.
3. Mount the SA Module to the bracket with the connector facing down. See *Figure 4-5*.

Figure 4-5 SA Module Mounted on the Bracket (different mounting location shown)

SA Module Connector

Mount the SA Module

4. Secure the SA Module Cable Harness to the tractor using nylon cable ties.

Roof Module Installation

- *Safety Notes*
- *Roof Rail Installation*

Safety Notes

- The AutoSteer system must be powered OFF when installing or removing the Roof Module.
- The Roof Module must always be firmly secured to the Roof Rail using the hardware whenever the vehicle is in operation to prevent the Roof Module from releasing from its bracket and falling.
- The Roof Module must be removed when transporting the vehicle at speeds above 30 mph.
- Ensure you are in a stable position on the tractor platform when removing the Roof Module, so that you do not fall or drop the Roof Module.
- Use a ladder to install the AutoSteer Roof Rail.



Roof Rail Installation

1. Place the ladder as close as possible to the side of the cab.

Note: The ladder is necessary to install the Roof Rail and Roof Module.

2. Locate the two bolts on each cab roof side. See *Figure 5-1*.
3. Remove the two bolts on each side. See *Figure 5-1*.

Figure 5-1 Mounting Bolt Locations



4. Place 4 of the flat washers provided with the installation kit on top of the existing washer on both bolt holes. See *Figure 5-2*.
5. Place the Roof Rail on top of the washers and center it over the cab. See *Figure 5-2*.
6. Place another flat washer on top of the Roof Rail and then install the longer mounting bolts provided with the installation kit.

Figure 5-2 Mount Rail on Spacer

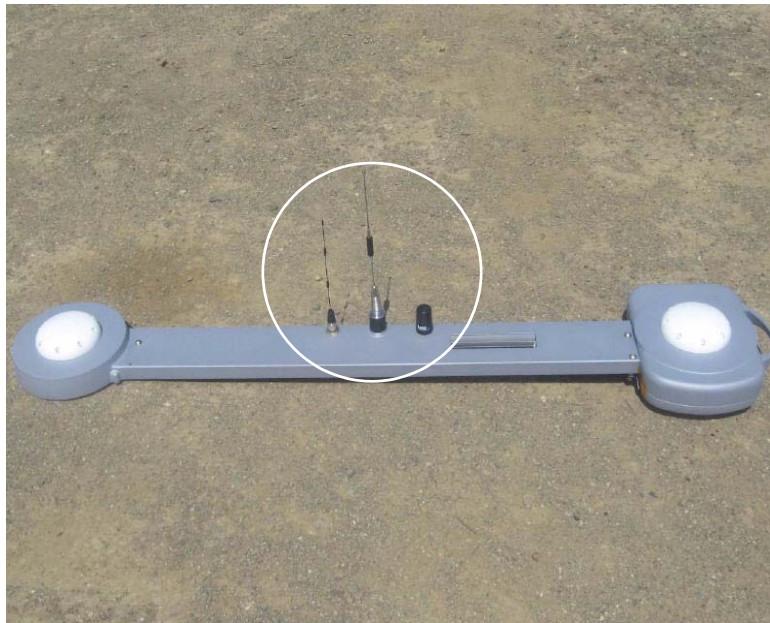
7. Tighten the Roof Rail securely with a 15/16" socket, short extension, and ratchet. See *Figure 5-3*.

Figure 5-3 Tighten Rail Bolts

8. Attach the three antennas to the proper antennas connections on the Roof Module. See *Figure 5-4*.

Note: Hand tighten the connections. Do not over tighten.

Figure 5-4 Attach the Antennas



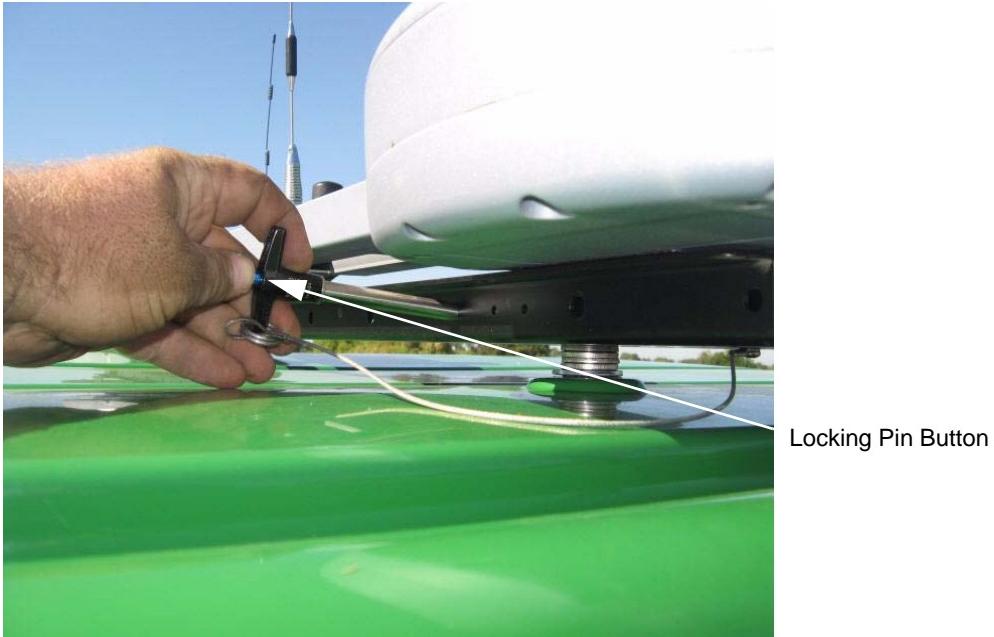
9. Place the Roof Module on the Roof Rail. See *Figure 5-5*.

Figure 5-5 Roof Module on Roof Rail



10. Remove the locking pin from the Roof Rail. See *Figure 5-6*.

Note: Press the button on the end of the handle to allow the pin to be removed.

Figure 5-6 Removing the Locking Pin

11. Adjust the Roof Module position on the Roof Rail.
12. Re-insert the locking pin to lock the Roof Module onto the vehicle. See *Figure 5-7*.

Figure 5-7 Locking Pin Inserted

13. Bend the Radio Antenna forward and latch in the wire clip to hold it from rubbing on the Roof Module. See *Figure 5-8*.

Figure 5-8 Latching Radio Antenna



Wire Clip

Figure 5-9 Roof Module Installed



Display Installation

This **Display Installation** chapter contains information for installing and adjusting the Display in the following sections:

- *Introduction*
- *Installation Procedure*

Introduction

Note: The Display components may different depending on the model vehicle and the specific Display being installed.

Installation Procedure

1. Unscrew the threaded plastic hole caps from the cab post. See *Figure 6-1*.

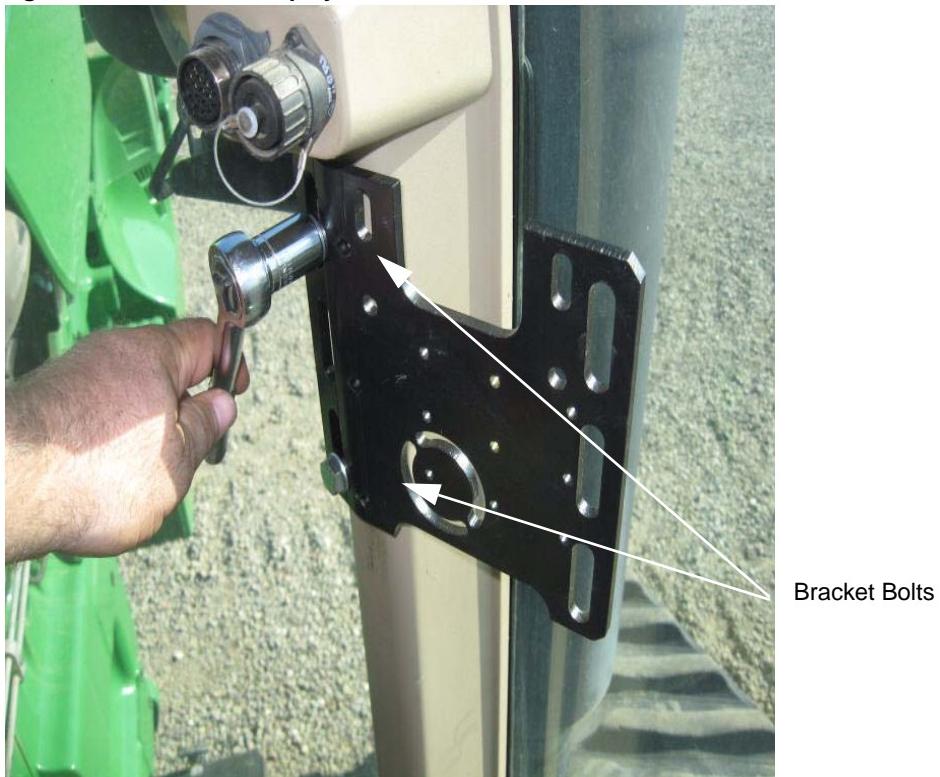
Figure 6-1 Plastic Mounting Hole Covers



Mounting Bracket Positions
(threaded hole cap locations)

2. Choose the holes on your Monitor Bracket that provide a good mounting height.
3. Install the Display Bracket on the right side of the cab using the two bolts provided. See *Figure 6-2*.

Figure 6-2 Mounted Display Bracket



4. Install the RAM Mount Base Ball (1-1/2" diameter) on an existing Display Bracket on the right side cab post. See *Figure 6-3*.

Figure 6-3 RAM Base Installed on Display Bracket



5. Secure the RAM Base using four 10-32x3/4 Phillips screws.
6. Secure the Display to the RAM Base using the long mount arm.
7. Loosen the wing nut to adjust the monitor position and viewing angle.

Connecting System Cables

This **Connecting System Cables** chapter provides information for connecting the Main Cable Harness and the SA Module Cable Harness to the various vehicle and AutoSteer components in the following sections:

- *SA Module Harness*
 - *SA Module Connection*
 - *Wheel Angle Sensor Connection*
 - *Steering Valve Connections*
 - *Steering Valve Location*
- *Main Cable Harness*
 - *Roof Module*
 - *Main Cable Harness Connections Inside Cab*
 - *SA Module Harness*
 - *Cab Power*

SA Module Harness

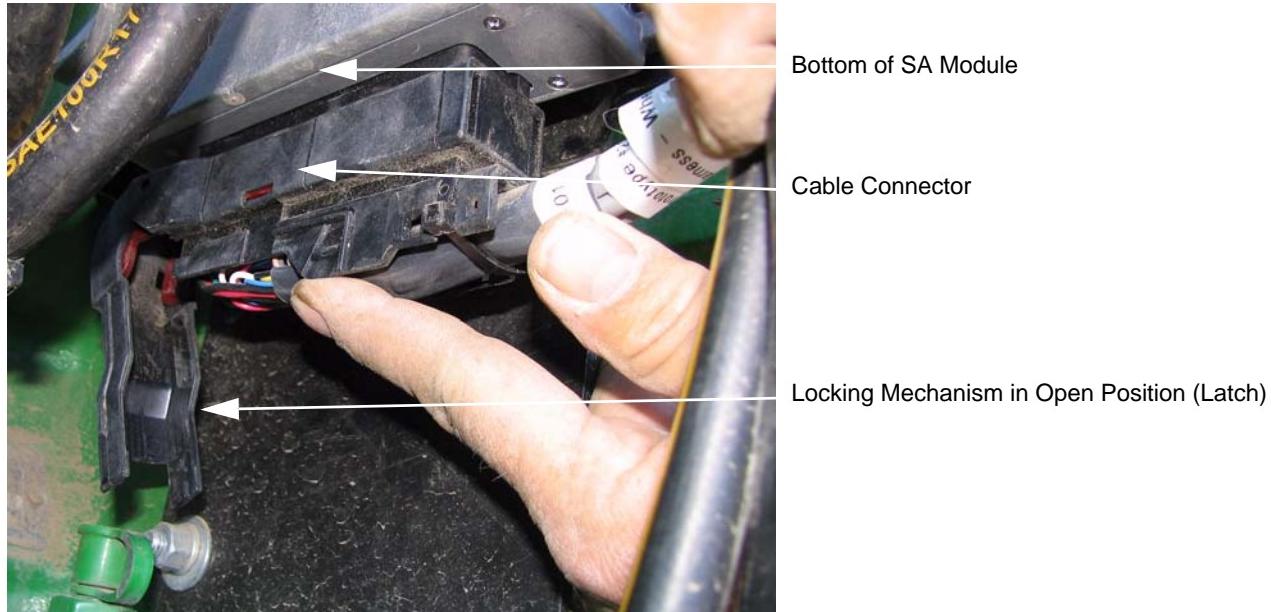
This **SA Module Harness** section contains the following sub-sections:

- *SA Module Connection*
- *Wheel Angle Sensor Connection*
- *Steering Valve Connections*

SA Module Connection

1. Connect the SA Module Cable Harness to the SA Module. See *Figure 7-1*.

Figure 7-1 Connecting SA Module Connector (different vehicle shown)



2. Close the cable connector locking mechanism as shown in *Figure 7-2*.

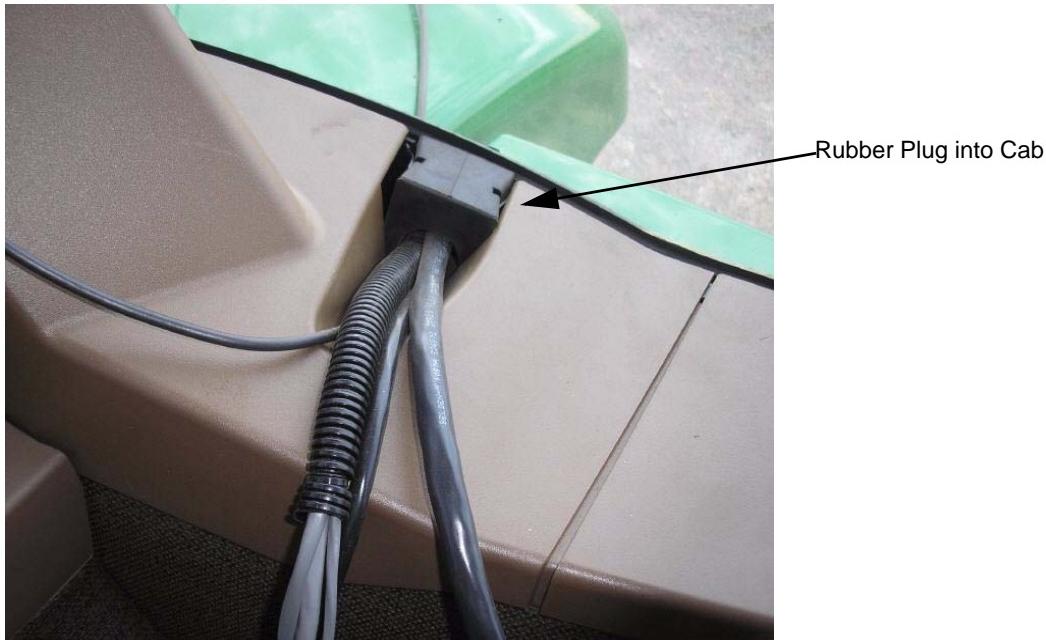
Figure 7-2 SA Module Connector (closed).



3. Route the SA Module cable into the cab through the rubber plug under the right or left side of rear window. See *Figure 7-3*.
4. Route the other half of the SA Module Cable Harness under the cab towards the steering valve and Wheel Angle Sensor on

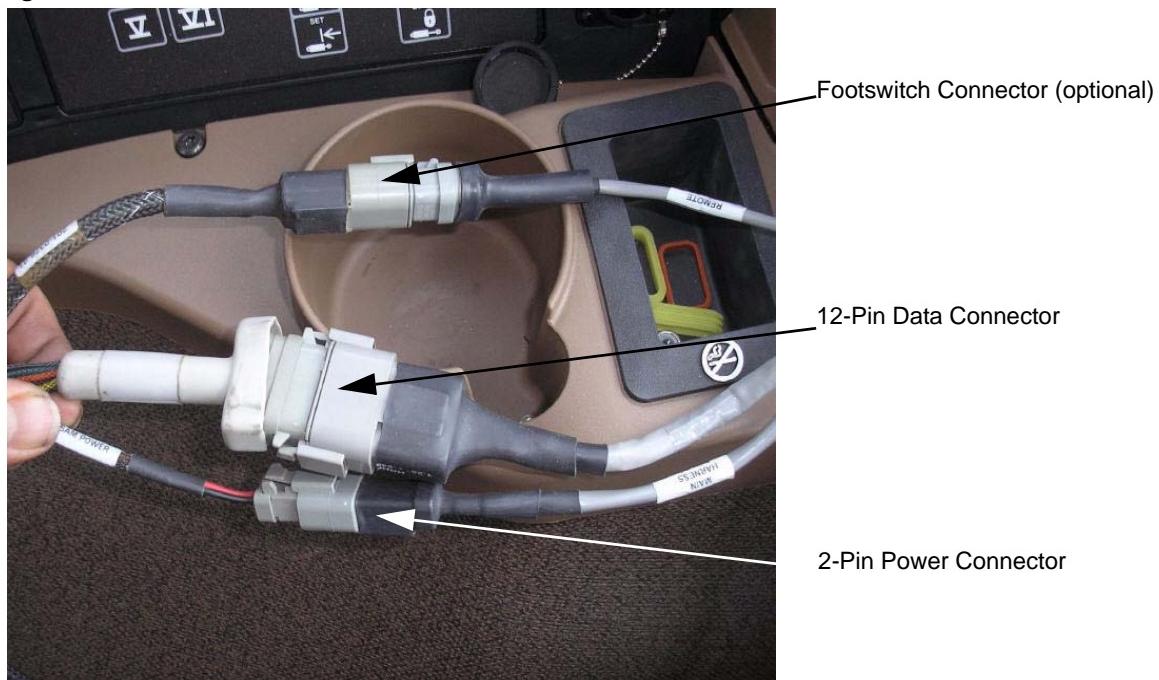
the left side. See *Figure 7-3*.

Figure 7-3 Routing the SA Module Harness into the Cab



5. Connect the 12-pin data, 2-pin power and 4-pin footswitch (if required) connectors between the Main Cable Harness and the SA Module Cable Harness. See *Figure 7-4*.

Figure 7-4 SA Module Cable Harness to Main Cable Harness Connections



6. Proceed to the *Wheel Angle Sensor Connection* procedure.

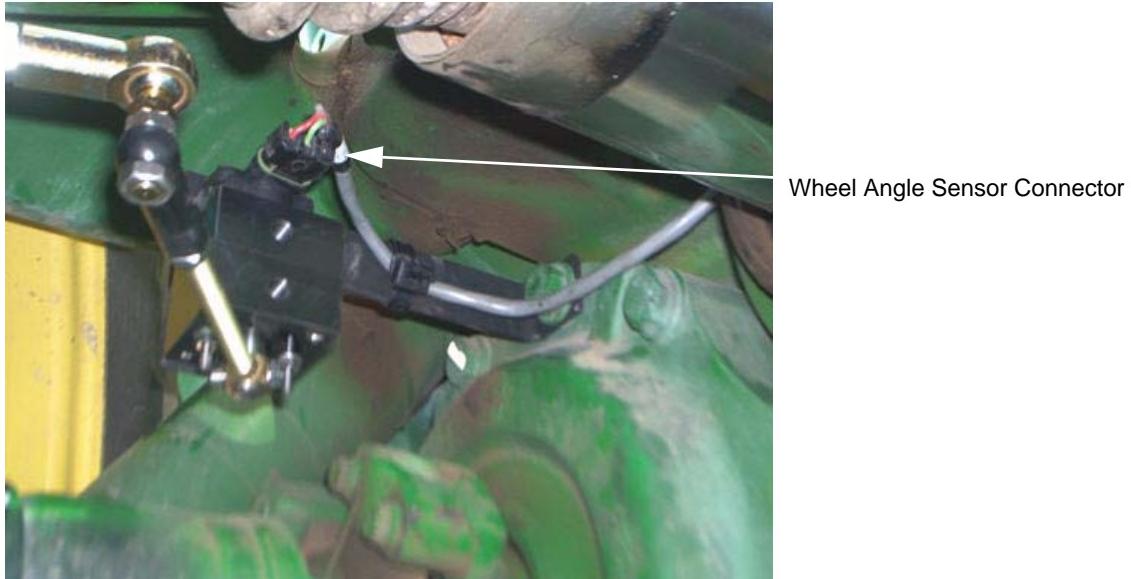
Wheel Angle Sensor Connection

1. Route and secure the Wheel Angle Sensor cable from the SA Module beneath the cab to the Wheel Angle Sensor.

Note: Use a cable puller to make routing the cable under the cab easier.

2. Attach the cable to the Wheel Angle Sensor. See *Figure 7-5*.

Figure 7-5 Wheel Angle Sensor Connection



Steering Valve Connections

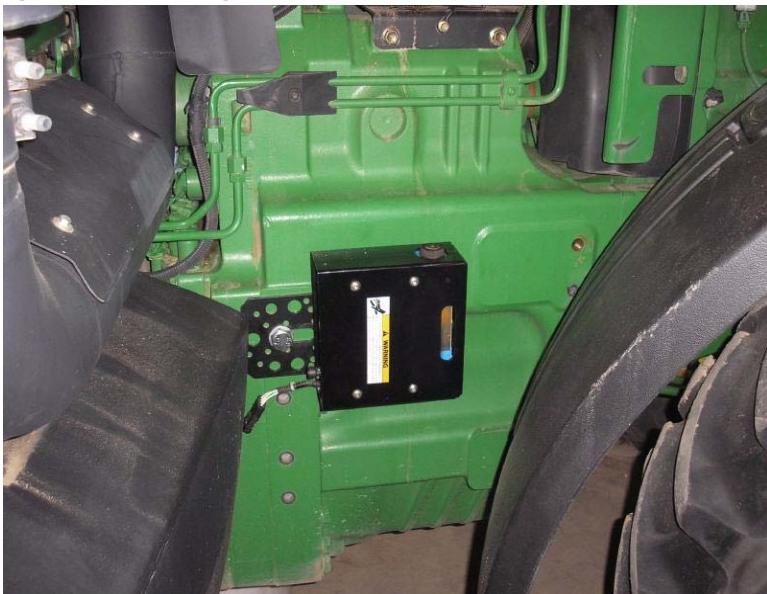
This **Steering Valve Connections** section contains the following sub-sections:

- *Steering Valve Location*

Steering Valve Location

The steering valve is located on the vehicle's right side. See *Figure 7-6*.

Figure 7-7 shows the steering valve connections.

Figure 7-6 Steering Valve Location**Figure 7-7 Steering Valve Connections**

Main Cable Harness

This Main Cable Harness section contains the following sub-sections:

- *Roof Module*
- *Main Cable Harness Connections Inside Cab*
- *SA Module Harness*
- *Cab Power*

Roof Module

1. Route the cable out the rear of the cab window through the rubber panel in the lower right corner of the rear window and secure with cable ties. See *Figure 7-8*.

Figure 7-8 Main Cable Harness Exiting the Vehicle Cab

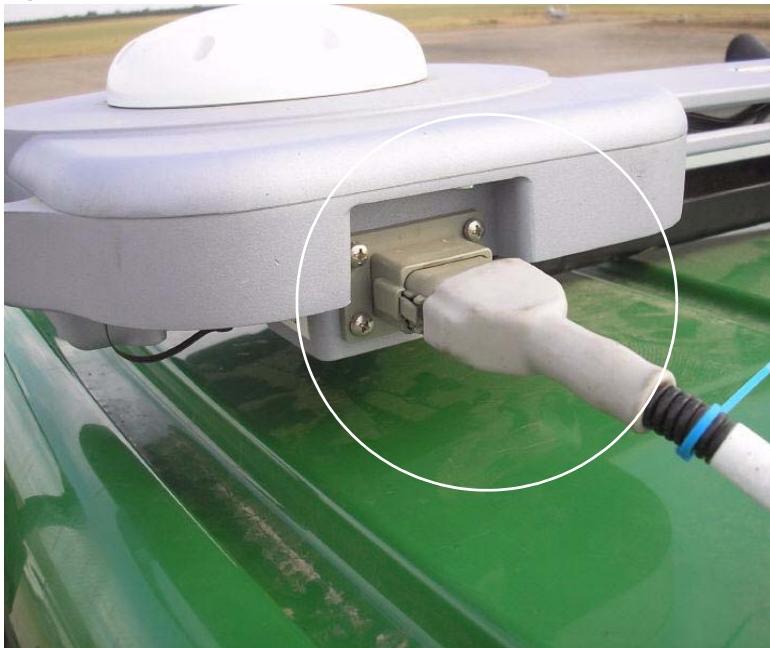


2. Attach the cable to the Roof Module. See *Figure 7-9*.

Orient the 12-pin connector so the word “TOP” on the cable connector is pointing upwards (towards the sky). Insert the cable connector into the Roof Module. Push the connector in until it “clicks” and locks in place. To remove, grasp the connector to compress the two side latches and pull away from the roof module.

Note: Do not force the connector. If the connector does not engage easily, check the correct orientation of the connector.

Figure 7-9 Roof Module Main Cable Harness Connection

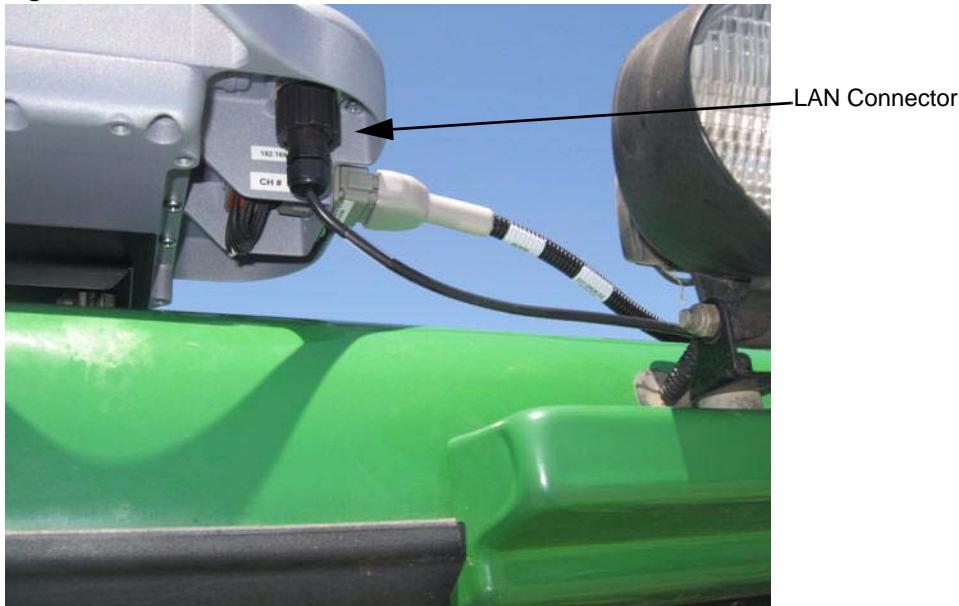


3. Attach the LAN connector to the Roof Module. See *Figure 7-10*.

Orient the Ethernet cable connector with the connector under the receiver so the contacts on the cable connector are pointing towards the back of the vehicle. (This will usually be towards your right side if you are standing on the left side of the vehicle and looking towards the roof module.) Slide the cable connector into the receiver and rotate the plastic bayonet sleeve clockwise to lock the connector. The bayonet sleeve will “click” when it fully engages and locks. To remove the cable, rotate the bayonet sleeve counterclockwise until it “clicks” and pull the connector down or away from the roof module.

Note: Do not force the connector. If the connector does not engage easily, check the correct orientation of the connector.

Figure 7-10 Roof Module Main Harness Connections



Main Cable Harness Connections Inside Cab

Figure 7-11 shows the Main Cable Harness connections used inside the cab. *Table 7-1* shows the functions of the Main Cable Harness cab connectors. Refer to your Display's User Manual for instructions on connecting the Main Cable Harness connections shown to the correct ports and harnesses on the Display and Display cables.

Figure 7-11 Main Cable Harness Cab Connections

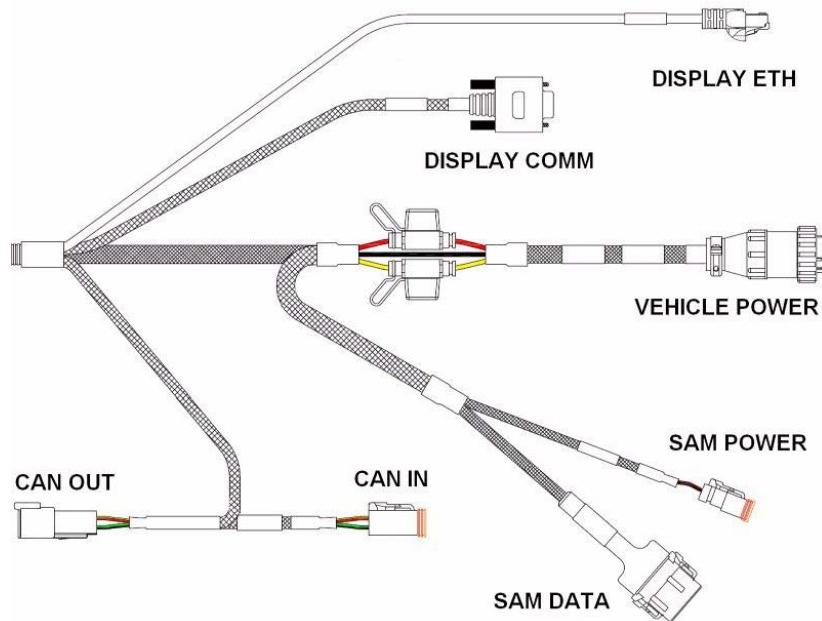


Table 7-1 Cab Main Cable Harness Connector Functions

Main Cable Harness Connector	Connector Function
DISPLAY ETH	Display Ethernet Port (RJ-45)
DISPLAY COMM	Display Communication Port (DB-9)
VEHICLE POWER	12 Volt Power Supplied by Display Harness
SAM POWER	Power for SA Module
SAM DATA	Data for SA Module
CAN IN	Not Used for This Installation
CAN OUT	Not Used for This Installation

SA Module Harness

1. Connect the 12-pin data and 2-pin power connectors between the Main Cable Harness and the SA Module Harness. See *Figure 7-12*.

Figure 7-12 SA Module Harness to Main Cable Harness Connections



Cab Power

Note: The following steps show the procedure for connecting to the power outlet inside the cab. If you are not using the power outlet inside the cab, refer to your Display's User Manual for cab power connection instructions.

1. Locate the 12V power outlet on the cab console's right side. See *Figure 7-13*.
2. Attach the cable to the cab power outlet. See *Figure 7-13*.

Figure 7-13 Cab 12V Power Outlet



Main Cable Harness

Calibration and Tuning Notes

This **Calibration and Tuning Notes** chapter contains information for starting the Calibration and Tuning procedures in the following sections.

- *Vehicle Specific Installation Calibration and Tuning Guidelines*
 - *Transducer Calibration*

Vehicle Specific Installation Calibration and Tuning Guidelines

Note: For optimal steering performance, the AutoSteer system must be fully calibrated and then tuned.

Transducer Calibration

The transducer calibration procedure on this vehicle is different than other AutoSteer installations because the transducer is measuring a low pressure Load Sense pressure signal. In order to provide good manual kick-out response, you must calibrate the pressure transducer HIGH number to be about 3000 counts above the LOW number.

Confirm that the pressure transducer calibration is correct by testing the manual kick-out feature while driving in AutoSteer mode. AutoSteer should disengage when you turn the steering wheel. If spontaneous kick-out occurs while in AutoSteer mode, recalibrate the pressure transducer and increase the HIGH value slightly. Repeat this procedure until you obtain good manual kick-out without spontaneous kick-out in AutoSteer mode.

On this vehicle, the steering wheel will turn freely and AutoSteer should kick-out when the driver turns the steering wheel while in AutoSteer mode. This result is the expected behavior on this vehicle and is different than other AutoSteer installations where the steering wheel cannot be turned while in AutoSteer mode.

Final Hardware Installation Checklist

This **Final Checklist** chapter contains the verifications steps necessary after the installation of the AutoSteer system.

Note: The Final Hardware Installation Checklist is on the back of this page. Tear this page out of your manual and fill in the checklist after the installation. You should keep a copy of this checklist for future reference when servicing the vehicle.

Machine Model: _____ Year: _____ Serial #: _____

Customer Name: _____

Location/Address: _____

AutoSteer Installation Kit Part Number: _____

NOTES

Name of Installer: _____ Date: _____

System Installation Checklist

1. Wheel Angle Sensor Installed and all fasteners are tight.
2. Monitor Bracket Installed and all fasteners are tight.
3. Roof Rail is installed and all fasteners are tight.
4. SA Module is installed and all fasteners are tight.
5. All cable ends are connected.
6. All cables are secured with cable ties.

Hydraulic Installation Checklist

1. Valve Bracket is installed and all fasteners are tight.
2. Valve is installed and all fasteners are tight.
3. All hose fittings are tight.
4. Check for oil leaks on all hydraulic connections.
5. All hoses are routed and secured with cable ties.
6. Manual steering is normal after the AutoSteer installation.
7. Relief Valve is adjusted.

AutoSteer Performance Checklist

1. Complete AutoSteer system calibration.
2. Complete AutoSteer system tuning.
3. Check total Wheel Angle Sensor counts. Value_____
4. Line acquisition is satisfactory.
5. On-line steering is satisfactory.
6. Manual override (kick-out) is working.
7. Steering speed from lock-to-lock is satisfactory. Value_____ Sec.

Note: See the *Calibration and Tuning Notes* chapter for additional information.
